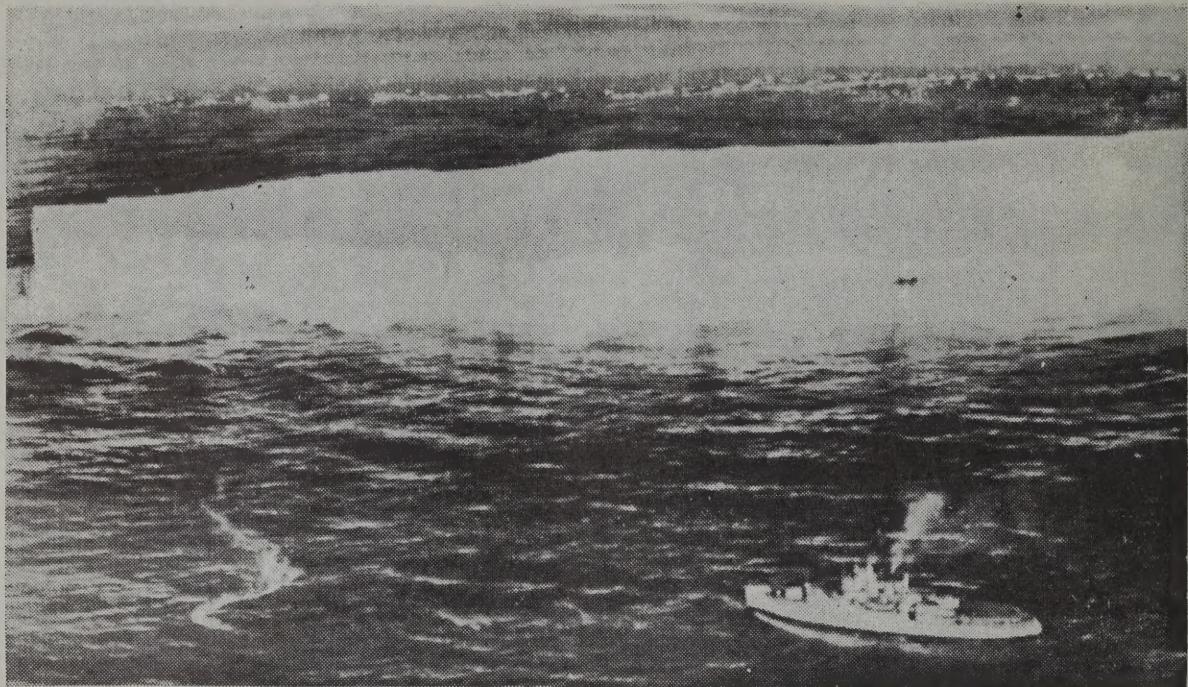


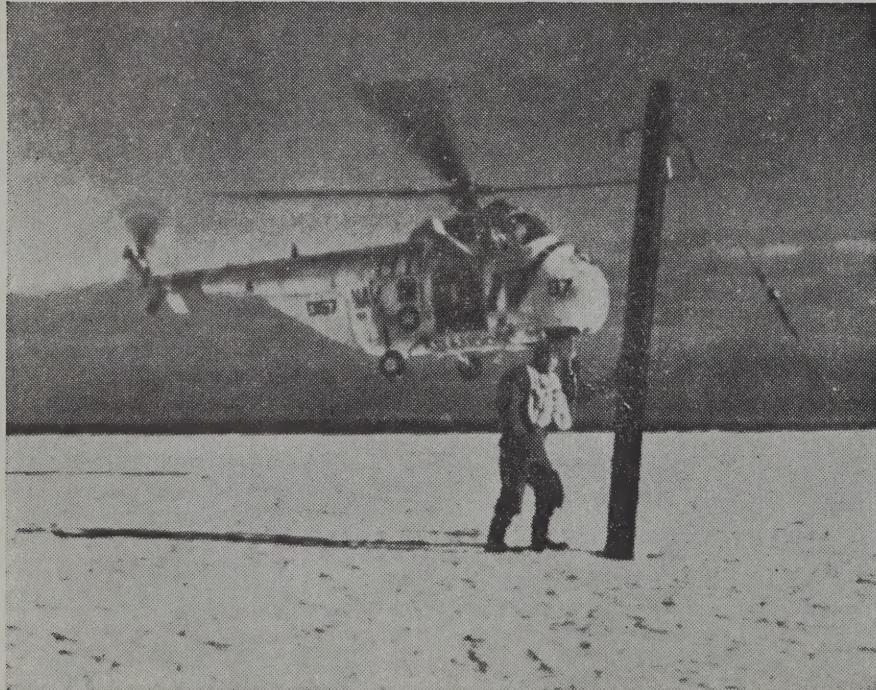
THE POLAR TIMES



Navy Ship Sights Remains of Little America III on Iceberg Far at Sea

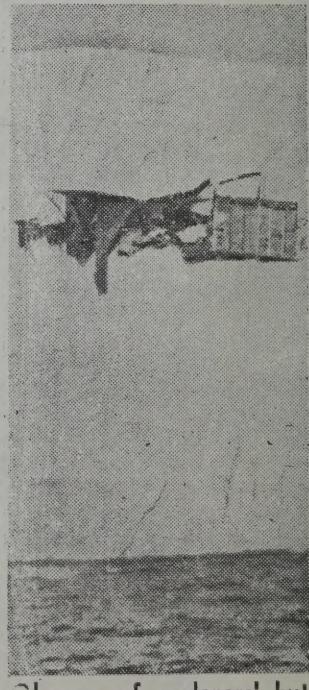


United States icebreaker Edisto, engaged in oceanographic work in Antarctica's Ross Sea, cruises off tabular iceberg on which camp was spotted in late February. Little America III was built by Adm. Richard E. Byrd in 1940-41.



U.S. Navy via United Press International Telephotos

Lieut. Comdr. A. R. Schroder of the Edisto inspects one of the wooden poles still standing at camp. Helicopter in the background waits to take inspecting party back to ship.



Closeup of explorers' hut on sheer face of quarter-mile-long iceberg.

The Polar Times

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No. 56.

JUNE 1963.

Third Little America Is Afloat 300 Miles From Original Site

McMURDO SOUND, Antarctica—Crewmen aboard the Navy ice-breaker *Edisto*, engaged in oceanographic work in the Ross Sea, have sighted the remains of one of the early United States stations in an iceberg far out at sea.

The remnants of what appears to be Little America III, built by Rear Adm. Richard E. Byrd's expedition of 1940-41, were found embedded in a quarter-mile-long iceberg almost 300 miles west of the station's original position at Kainau Bay on the Ross Ice Shelf.

The station's position when first seen put it 170 miles from the Navy's main logistics staging area for Operation Deep Freeze here.

Electric power poles jutting from the top of the iceberg were clearly seen while along its 100-foot sheer face appeared a room with cans and equipment placed neatly on shelves.

A helicopter of Utility Squadron Four, aboard the *Edisto* landed on the iceberg, but the crewmen were unable to enter the camp which was covered with 25 feet of snow, the Armed Forces Press Service reports.

The research station, like the other four Little Americas, was built on the seaward edge of the Ross Ice Shelf, an ice field about the size of California and fed by glaciers. As the shelf moves north at about four feet a day, huge icebergs break off and float away.

Icefalls will eventually doom all the camps, the National Geographic Society says.

Admiral Byrd established the original Little America in January, 1929, during his first assault on the frozen continent. The outpost stood 795 miles from the geographic South Pole.

Little America II was built atop the first, in 1934. The miniature city had a broadcasting plant, four-cow dairy and motion-picture theater.

Little America III, now at sea, was Admiral Byrd's headquarters for the 1939-41 United States Antarctic Service Expedition. Members of the group walked six miles south to abandoned Little America II and picnicked on perfectly preserved

Jobs at Poles Offered By Weather Bureau

Bachelors interested in jobs with wide-open possibilities on another new frontier (the North and South Poles) are needed now by the United States Weather Bureau.

Qualified meteorologists and electronic technicians will be paid between \$7,290 and \$9,475 a year, plus a \$2,800 polar allowance, a spokesman said. Room and board, travel and polar clothing will also be furnished free, a spokesman said.

He added that anyone interested in applying should mail an application, Form 57, obtainable from a local post office, to the personnel management division of the United States Weather Bureau, Washington 25.

six-year-old beefsteak, bread, butter and candy.

When Admiral Byrd led the Navy's mammoth "Operation Highjump" in 1946 to 1947, a tent city—the fourth Little America—was set up on the ice two miles north of the third.

During the 1956 Operation Deep Freeze, in support of the International Geophysical Year, Admiral Byrd established Little America V, the last before his death a year later. The five-acre site had 17 oil-heated buildings, hot and cold running water and innerspring mattresses. As a final touch, Navy ships dispatched Fourth of July fireworks, Santa Claus suits, and 15,750 birthday candles.

Be Happy You're Far From Vostok

Washington, Jan. 23—(AP)—When you are shivering these cold days you might cheer yourself up by thinking of the Russians at a Soviet Antarctic station called Vostok.

That's the coldest spot in the world. The U. S. Weather Bureau says the thermometer there registered a global record by slumping to 126.9 below zero on Aug. 24, 1960.

As for the North American continent, the most frigid weather ever recorded was 81 below zero. That happened February 3, 1947, at Snag in Yukon Territory, Canada. Next coldest reading: 76 below at Tanana, Alaska, in January, 1886.

311 Americans To 'Hibernate'

By National Geographic News Service

Washington

As the United States basks in summer sunshine, 311 Americans at the bottom of the world are enduring blizzards, subzero cold, and a four-month-long night.

The Navy men and scientists constitute the winter party left in Antarctica this season for the United States Antarctic Research Program of the National Science Foundation and its support arm, the Navy's Operation Deep Freeze.

Snow-covered Antarctica, once as inaccessible as the moon, is an increasingly vital laboratory for the world's scientists.

During the April-through September polar winter, naval technicians repair and overhaul equipment and vehicles hard-used during the busy summer season.

U.S. Team Plans to Measure Speed of South Pole Glacier

WASHINGTON (Science Service)—The great ice mass of windswept Antarctica flows slowly from the interior toward the coast at a rate of about 30 feet a year.

United States scientists know it flows about 300 feet in 10 years, but plan to measure the rate more accurately in the interior, Dr. Albert P. Crary of the National Science Foundation told the Geological Society of Washington.

Almost in the center lies the South Pole, on a plateau about 10,000 feet high. The ice slowly moves downhill from this elevation toward the edges of the sea, Dr. Crary said. There it melts and breaks off in the form of icebergs. There is not much change in the total amount of ice mass in Antarctica. However, a precise measurement of the ice lost into the sea and the ice gained from the snow that falls is difficult to obtain.

Ice has been found to lie about 14,000 feet deep in western Antarctica, he said. In eastern Antarctica it may lie as deep as a mile and a half. Under all this ice and snow there is rock.

Scientists at five year-round research stations will study auroras and continue observations in upper atmosphere physics, meteorology, and biology.

At Byrd Station, 600 miles from the South Pole, 33 men are living in buildings erected within huge tunnels 30 feet beneath the snowcap as protection against winter's 70-degree-below-zero temperatures and 60-mile-an-hour winds. All stations are cut off from the outside world except by radio throughout the long winter's night.

Nearly 4,000 men using 10 ships and 28 aircraft took part in the recently completed summer research season. Scientists took home 13 tons of records and specimens for analysis after surveying rock formations, making aerial maps, examining marine and insect life, and studying the general effects of the 5,000,000-square-mile icebox on the world's weather.

There were many highlights: Ten University of Minnesota scientists discovered mountains of pure white marble—in some cases polished to a high gloss by blowing snow and ice—in the Southern Heritage Range of the Ellsworth Mountains.

Studies on Lake Vanda in the Wright Valley disclosed that the ice-covered lake with curiously warm 80-degree water at its 200-foot bottom is probably heated by thermal activity below the lake floor.

Four geologists from Ohio State University, traveling by motor toboggan, located the world's southernmost volcano and rock outcroppings.

Topographic engineers of the United States Geological Survey used helicopters to make a 1,500-mile geodetic traverse over the high, windswept Trans-Antarctic Mountains and mapped 100,000 square miles of Antarctica.

Three turbine-powered helicopters made the first 'copter landings on the South Pole.

Rockets shot weekly from McMurdo Station disclosed air temperatures and wind profiles 40 miles above the ice-covered continent.

Antarctic Abounds in Rich Ores; Big Tourist Industry Envisioned

By ALLYN BAUM

The New York Times

Any economic potential in the Antarctic lies decades away, but the possibilities are considered enormous.

Surrounded by the richest seas in the world in oceanic life, Antarctica, as large as the United States and Europe combined, remains a vast unknown, barely mapped, rarely trekked and much of it still unseen.

Aside from a few years early in the 19th century, when New England sealers decimated the fur-seal colonies of the Antarctic coast, the only industry that has thrived in the area has been whaling. Even this has been severely restricted in recent years through international agreement among the whaling nations of the world.

The land mass of the continent lies buried beneath 7,000,000 cubic miles of ice and snow. Barely 2 per cent of the land mass can be seen above the ice cap and of this, only .05 per cent has been geologically explored. What has been uncovered thus far, however—16 minerals—gives evidence of heavy deposits of rich ores. Coal, for instance, is in abundance, in some places as much as 13 feet thick. Gold, tin, molybdenum, antimony and silver are some of the elements that have also been uncovered. It is a question of tapping these resources.

Man can live in that cruel continent. This has been proven. The operation of a nuclear power plant, though only the partly successful in the last year, may hold the key to turning the great Antarctic waste into at least a partly habitable area.

Water, next to fuel the most precious item on the Antarctic, will soon be drawn from the sea, desalinized by the nuclear reactor and sent through the taps of McMurdo Sound. This will end the tedious and costly snow-melting system, which

costs about \$1.25 a gallon. A sewerage system is also in preparation.

Some expect that the real value of Antarctica in the foreseeable future may not necessarily lie in heavy industry and mining, but in tourism.

Well-informed travel experts agree. Voit Gilmore, director of travel for the Department of Commerce, believes there is a great attraction in the Antarctic for the winter sports enthusiast. It would be unrivaled for skiing, tobogganing, sledding, snow shoeing, possibly just plain gawking.

If tourism is an economic potential, it will depend heavily on conquering the transportation problem.

The Southern Hemisphere is eager to find an aerial short cut to the Northern Hemisphere, bypassing the long trans-Pacific or trans-Asiatic flights. Australia is particularly eager to find a shorter faster route to the United States and Europe to tap tourist trade.

As the North Pole has become the "short cut" between London, Oslo, Stockholm and Copenhagen and the United States West Coast, perhaps a South Pole flight will cut the route between Sydney, Melbourne, Auckland and Wellington to London and New York. This will depend on the establishment of accurate weather stations, planes built to withstand the extreme cold, research into the building of runways on snow and ice and the construction of such ice runways as

It's Freezing Warm In Antarctic Summer

Christchurch, New Zealand, Jan. 2—(UPI)—Antarctic temperatures soared as high as freezing today.

It is summer in the Southern Hemisphere and U. S. Antarctic stations reported comparatively high temperatures. The coldest spot was at the Amundsen-Scott South Pole base where the temperature was 18 degrees below zero.

The McMurdo station reported a high of 29 degrees. McMurdo is 850 miles north of the Pole.

The most northerly station at Cape Hallett in the so-called "Banana Belt" registered 32 degrees.

At Byrd Station, where the men live in tunnels cut in ice which is nearly two miles deep, the temperature was a "mild" 20 degrees.

emergency strips.

If tourism is one economic resource there, the sea is another. There are areas in the Antarctic oceans in which the sea is almost of a pea-soup consistency because of the oceanic life that thrives in the freezing waters. This may be an answer to feeding the exploding world population, for the waters may provide the nutritional key.

For nations with too much food, the Antarctic—one huge refrigerator—could become the food locker of the world. Food is preserved in a perfect state in the Antarctic because of its dry, cold, vaporless atmosphere.

The future of the Antarctic hinges on the harnessing of cold weather techniques to atomic



MOMMA IS WORRIED—An anxious mother penguin sitting on egg watches the approach of Ferdinand Mendenhall, publisher of the Van Nuys (Calif.) News and Green Sheet, who as a naval reserve captain was sent on "operation Deep Freeze" to the South Pole. The newsman is in the midst of a large Adelie penguin flock at Cape Royds in Antarctica, which he described as "most forbidding, desolate spot in world."

The Polar Times

Published June and December by the AMERICAN POLAR SOCIETY, Care August Howard, Secretary, 98-20 62nd Drive (Apt. 7H), Rego Park 74, New York.

AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.

1st 'Copters Land At South Pole

FT. EUSTIS, Va., Feb. 4 (AP) — Three of the Army's new UH-1B helicopters made the first helicopter landings at the South Pole today, the Army Transportation Center here announced.

The turbine powered helicopters flew 182 miles from 9900-foot Mt. Weaver to the U. S. camp at the Pole. Temperature was 29 below zero.

Pilots were Capt. Frank H. Radspinner, Capt. Neal B. Earley and 1st Lt. Charles W. Beaman.

energy. When that happens, man will prevail and the Antarctic may no longer be the frozen, forgotten, forbidding continent but the land of six months' sunshine, lode mines, busy smelters and thousands of miles of unbroken ski trails.

Polar Peak Scaled

LONDON, Jan. 15 (AP).—Three Britons have conquered the hitherto unscaled 9000-foot Mount Gaudry, the highest mountain on Adelaide Island inside the Antarctic Circle, the Admiralty reports.

American Polar Society

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IGY Sequel Ready To Scan Earth, Sun

N. Y. Times News Service

Washington, March 4—The United States has outlined its extensive program of satellite, rocket and balloon flights and other experimental studies of a period of unusual quiet on the sun.

The coming International Years of the Quiet Sun, 1964-65, as they are known in the world's scientific communities (they are called IQSY for phonetic reasons) will involve more than 50 nations.

They are a sequel to the highly successful International Geophysical Year, 1957-58, whose broad purpose also was the study of earth-sun relations.

IQSY is scheduled during a low point in the 11-year cycle of sunspot and solar flare activity. The IGY occurred during the last high point of the cycle.

Scientists will compare data from both programs to gain a better understanding of how the explosive, million-degree-solar atmosphere affects the earth and the space between planets.

IQSY begins Jan. 1, 1964, and will run to the end of 1965.

In general, the program will concentrate intensively on upper atmosphere and space phenomena relating to bursts of particles from the sun and the continuously blowing "solar wind," a tenuous wave of particles with extremely great speeds.

U. S. participation will be through a special committee within the National Academy of Sciences and National Research Council. The committee will represent the nation's scientific community on the International IQSY Committee within the International Council of Scientific Unions.

Dr. Martin A. Pomerantz, of the Franklin Institute of Philadelphia, is chairman of the U. S. committee.

President Kennedy last year authorized U. S. participation in IQSY and told the National Science Foundation to coordinate IQSY activities of federal agencies and provide funds for added programs.

Some of the highlights of the U. S. participation will be:

Meteorology: World wide balloon and rocket networks to gather data on the earth's heat

budget, general air circulation, high-altitude disturbances, and upper-atmosphere trace constituents—such as ozone and water vapor—which are important out of proportion to their abundance.

Geomagnetism: A world magnetic survey to map and study the earth's magnetic field, including rocket flights into space.

Aurora: Comparisons of auroral displays at solar minimal activity with those during the IGY, and measurement of the particles that strike the upper atmosphere to produce the visible light. The use of satellites and space probes will be complemented with an "all-sky camera network."

Airglow: Detailed observations of the very weak visible glow, apparently involving a corona of hydrogen gas enveloping earth.

Ionospheric and physics and radio astronomy: studies of the quiet ionosphere to learn how solar events disturb it, satellites and ground-based radar. Measurements of radio signals from the intense radiation belt surrounding the planet Jupiter will be made.

"Space," Dr. Pomerantz observed, "is not as empty as we may think."

He likened space to a fishbowl with the earth inside it, and with the cosmic rays bouncing around inside this bowl in all directions.

As they come within the influence of the magnetic fields in the solar system, the rays do not lose their energy, but they constantly change their direction of travel.

Eventually they reach the earth's atmosphere, where they set up secondary, or chain reactions. The original, or primary rays, are absorbed by the atmosphere, but the secondary rays get through.

To get a measurement of the primary rays mankind must go into space above the atmosphere.

And why must this be done?

This is the age of space travel, Dr. Pomerantz said. It is the age when man will go to the moon and the planets and will therefore rise above the protective shield of the earth's atmosphere.

Once out in the vacuum of space he will be subjected to radiation from the cosmic rays. Some of this radiation can be



Dr. Martin A. Pomerantz

Dr. Pomerantz Heads IQSY Planning Group

March 4

Dr. Martin A. Pomerantz, director of the Bartol Research Foundation of the Franklin Institute, today was named chairman of the U. S. planning group for the International Year of the Quiet Sun, 1964-65.

Dr. Pomerantz, a native of Brooklyn, received his A.B. degree from Syracuse University in 1937; his M.S. from the University of Pennsylvania in 1939 and his L.H.D. from Temple University in 1951.

He became a research assistant at Bartol in 1938 and has been director since 1959.

He will head the 40-member U. S. delegation to a IQSY general assembly in Rome, March 18-22. He also is vice president of the international committee which will coordinate the scientific venture.

More than 50 nations will work together in an effort to find how the solar atmosphere affects earth and space environment.

The IQSY is an outgrowth of the International Geophysical Year of 1957-58.

lethal Man, somehow, will have to protect himself.

But it is first necessary to know the full extent of the danger. Hence, a study of the cosmic rays.

Many new techniques for conducting such studies have been developed since the IGY,

Dr. Pomerantz said.

"The Bartol Research Foundation," he went on "maintains cosmic-ray stations at both polar regions. These are being expanded. In fact, new stations are being established at the geographic South Pole. We already have one at McMurdo Sound, 800 miles away.

"We have another station aboard the U. S. research ship Eltanin, in the Antarctic region. We have a station at Thule, Greenland, which happens to be the geomagnetic North Pole. We expect to have another station elsewhere in Greenland.

Still another place where Bartol has a station is a flying laboratory aboard a Navy plane which is operated by the Navy's Oceanographic office. This plane is now on a trip around the world.

Polar-circling balloons are another means of measuring the rays. These balloons are sent aloft in the polar regions where they are carried around by the so-called "polar vortex."

The balloons carry various types of instruments for a study not only of cosmic rays but of meteorology and the auroral effects.

"The unique feature of the "will be real international collaboration, not only in exchanging data but in conducting joint experiments together.

"For example, in one type of experiment involving radio transmission between two locations—the U. S. can do the transmitting and some foreign nations can receive."

In addition to cosmic rays, the IQSY will study meteorology with the aid of a worldwide network of balloons and rockets. Studies will be made of the upper atmosphere, the earth's "heat budget," the general circulation of the atmosphere and high-altitude disturbances.

There will be a study of the earth's magnetic field, the auroras, the ionosphere, radio astronomy and the "interplanetary medium"—or the space between the planets.

Another subject under scrutiny will be aeronomy, which deals with the physical, chemical and electrical properties of the atmosphere.

"We want to understand the process of nature," Dr. Pomerantz said. "We want to understand what's going on. It will be a real international effort."

Huge Icebergs Off Antarctic

McMURDO STATION, Antarctica—Some of Antarctica's icebergs are as large as Connecticut and drift for years around the continent.

8 POLES INDICATED IN MAGNETIC FIELD

Navy Data Support Theory of Earth's Forces

By WALTER SULLIVAN

The New York Times Western Edition

PHILADELPHIA, Dec. 28.—The central magnetic field of the earth appears to have eight poles, rather than two, according to evidence described here today.

The eight-pole theory is said to have been supported by readings obtained on 150,000 miles of flying since 1952 by specially-equipped Navy planes.

It is hoped that by next September these planes will have covered the entire surface of the earth open to American aircraft with flight lines no more than 200 nautical miles (230 statute miles) apart.

The program, known as Project Magnet, seeks to determine the shape of the magnetic field above the earth's surface with sufficient precision to aid in determining how the field is generated and why it changes from year to year. This, in turn, should make it possible to increase the accuracy of magnetic information appearing on Government charts and maps.

Such information is vital in enabling navigators of ships and planes to make use of the magnetic compass in safely reaching their destinations.

Broadly speaking, it had been thought until recently that the earth's magnetism was that which would be produced by a simple bar magnet near its center. It was recognized, however, that varying magnetic properties of the earth's crust made for local deviations from this model.

As described by scientists here today, it has become increasingly evident in the last five years that the prime component of the magnetic field, originating in the earth's core, is more complex than that of a bar magnet.

The latter type of field is demonstrated to students of elementary physics by holding a bar magnet beneath iron filings spread on a sheet of paper or glass. The filings arrange themselves in a pattern much like that of an apple sliced in two through its stem.

The Navy's observations were described in a symposium on the earth's magnetic field held in conjunction with the annual meeting of the American Association for the Advancement of Science. One of the two survey planes used in Project Magnet is on display at the Philadelphia International Airport.

The plane has just returned

from its maiden survey flight—a journey that took it as far south as Antarctica. The Super Constellation replaced a similar one that was wrecked two years ago while landing at McMurdo Sound in Antarctica.

It carries devices to record cosmic rays as well as magnetism. The rays are very high energy atomic particles raining on the earth from space. Although electrically charged, many have sufficient energy to penetrate the magnetic field and reach the earth. The nature of the incoming rays can, in turn, be used to postulate the shape of the field over various parts of the world.

Before it crashed, the earlier plane had made a grid-shaped succession of flights over both the north and south magnetic poles. Fortunately, its records were saved and have helped to throw new light on the complexities of those regions.

The project was described by Wilbert H. Geddes of the Navy's Oceanographic Office—formerly known as the Hydrographic Office—and by Dr. Martin A. Pomerantz who is responsible for the cosmic ray observations of the Bartol Research Foundation here.

Mr. Geddes said Project Magnet was now a permanent program that would follow the slow changes in the earth's magnetism.

The prime component of the earth's field is thought to be produced by electric currents generated by the flow of molten materials deep within the earth. According to Dr. Pomerantz, this field seems to be best represented by eight poles. Its complexity is presumably related to the as yet unknown flow patterns with the earth's core.

The theory that finally emerges will have to explain, for example, why the center of the magnetic field is several hundred miles from the center of the earth and also why it is moving at present toward the Pacific Ocean. It will also have to account for the fact that the axis of this field does not parallel the earth's spin axis, causing the magnetic poles to lie many hundreds of miles from the geographic poles.

Whale Takes On Russian Ship

LONDON (AP)—A Soviet whaling ship was rammed and crippled in the Antarctic by a whale.

The Soviet news agency said the whale attacked after a harpoon was buried in its blubber.

The massive head of the whale, a cachalot, smashed against the stern of the ship, snapping off the steel blades of its 2½ ton propeller.

A second harpoon burst finished off the threshing whale and the ship was repaired at sea.

Australians Take Earth Soundings

By ALBERT E. NORMAN

Australia-New Zealand Correspondent of The Christian Science Monitor

Sydney

A seven-man Australian Antarctic party led by a New Zealander has completed an 1,800-mile round trip into eastern Antarctica from the Australian station in Wilkes Land.

Purpose of the arduous journey was to learn more about the earth's seismicity.

Enduring temperatures as low as 114 degrees Fahrenheit, battling heavy winds and snow and working over a vast plateau at 12,000 feet altitude, the Australians scarcely could have had a rougher time in this four-months journey.

Midway point in this long polar trek was the U.S.S.R. Vostok station located at the south geomagnetic pole, where the Australians rested a few days before continuing their trip.

Every 30 miles along this rugged 1,800-mile route, the men drilled 240 feet into the ice to take seismic soundings which give a picture of the rock surface thousands of feet down.

At one point, the Australians found that bedrock was three miles beneath the ice sheet. In fact, most of the rock surface along the route was well below sea level under thousands of feet of ice.

Yet on the Antarctic map this eastern plateau zone is shown as part of the polar continent. Since the Australian survey, it would seem more nearly accurate to dub this great zone as a sea capped with ice.

To the west, the Ross Sea, thought also covered with land ice, was recognized on the map mainly as an ice shelf. Below this shelf, however, evidence points to a small depth of water.

West of the Ross Sea in adjoining Marie Byrd Land, seismic soundings show the rock surface to be 5,000 feet below sea level in places, which would leave room for more accurate geographic description of this Antarctic "land." In short, the ice in this region was two miles thick.

Determining just where the polar land and sea actually end and begin was only one of the tasks associated with learning why the Antarctic produces such slight seismic activity.

The New Zealand scientists recently published their theory explaining the connection between the calving of ice bergs and local evidence of earthquakes at New Zealand's Scott Base in the Ross Sea region. This indicates that when great icebergs break from the main

land ice mass, the movement could cause local earth tremors.

But in Marie Byrd Land, the two-mile-thick ice cap, for example, resting on the continental surface, could act as a seismic "suppressor." At least, that was one theory. On the other hand, in contrast, there was volcanic activity at the surface bordering the Ross Sea.

Recent seismic tests show that the earth's crust in eastern Antarctica, where the Australian party made its survey, was some 20 miles thick. Western Antarctica, which has more than its fair share of mountains, evidently does not possess such a thick continental crust.

Dividing the two great zones is the Ross-Weddell Graben, known to geologists as a possible rift valley. This is about 2,000 miles long coast to coast and 500 miles wide.

American polar field parties have been closely studying this vast depression to learn whether in fact it constitutes a sunken strait, dividing the continent into two subcontinents.

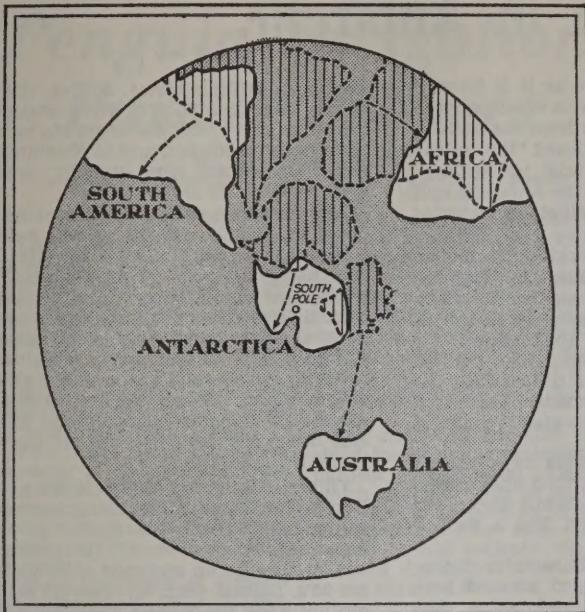
New Zealand seismologists were inclined to regard eastern Antarctica as the only truly polar continental zone. At the same time, the new evidence brought in by the Australians pointed to the likelihood that much of this continental zone was below sea level, making it a submarine continent.

Under its program to establish a worldwide research program on earthquake activity, the United States Coast and Geodetic Survey recently presented four sets of six seismographs to New Zealand's Seismological Observatory.

Some of these have been installed in New Zealand Antarctic stations and are capable of recording earthquake movements in three dimensions. In concert with the Seismological Observatory in Wellington, the two Antarctic stations are capable of covering a huge sector of Antarctic seismic activity.

Thus far, no earthquake has been traced to Antarctica from any outside zone. Discovering why Antarctica is so seismically "quiet" has been important in understanding the earth's overall seismicity.

The sea-leopard, which often reaches a length of 12 feet, inhabits the Antarctic regions and feeds largely on penguins, according to the Encyclopedia Britannica.



The New York Times

May 19, 1963

DRIFTING CONTINENTS: Magnetism in ancient rocks has been interpreted by Dr. S. Keith Runcorn of England as evidence that the southern continents were once clustered together as outlined above by the broken lines. Arrows indicate the subsequent drift. The map is based on one originally published in the journal *Nature*.

Australia Drifted 3,400 Miles Over the Ages, Scientists Think

By WALTER SULLIVAN

A team of three Australian scientists has concluded, with reservations, that their continent has moved some 3,400 miles, with respect to North America, during the last 100 million years.

At the start of that period, they believe, Australia was almost squarely at the South Magnetic Pole. Since then, they say, it seems to have drifted north into the Pacific Ocean at an average speed of about two inches a year.

This motion would be away from the Atlantic side of North America and towards the Pacific side.

The conclusions of the scientists are based on their studies of the magnetism in rocks laid down during various periods of geologic time.

This magnetism, they believe, is aligned along the magnetic field that existed when the rocks solidified. From these alignments they have calculated the locations of the magnetic poles at various times in the past.

The rocks that cooled during the more than 100 million years of the Mesozoic Era, or "Age of Reptiles," show little evidence of movement. However, those from the Cenozoic, or "Age of Mammals," show a steady "northward" shift.

Furthermore, the rocks of the Mesozoic point to a north magnetic pole that differs by 2,700 to 5,500 miles from pole locations indicated by the Mesozoic rocks of Europe and North America.

"It seems to us," the three scientists report, "that the most likely explanations of these results are either that there has been relative movement of large magnitude between eastern Australia, Europe and North America, or that the earth's magnetic field during the Mesozoic has not been dipolar."

The magnetic field that exists today is dipolar (or two-poles). It approximates the field that would be produced by a bar magnet near the earth's center. The magnetism is thought to be generated by movement of molten material in the core, guided in part by the earth's rotation.

Those who doubt that the continents have moved, with respect to one another, argue that the size of the core may have changed with time, changing the patterns of circulation. The magnetic field of the young earth may have had many poles, they say.

While the theory of continental drift was first published

Penned-In Scientists Battle Avoirdupois

By GRAHAM BILLING

SCOTT BASE, Antarctica,

Jan. 23 (Reuters).—

NEW ZEALAND'S Antarctic explorers eat like gourmets at this blizzard-swept base.

One of the major problems when the men—members of a scientific research team—are confined indoors by the weather is to avoid putting on too much weight. Yet the leaders of the expedition know that explorers as well as soldiers "travel on their stomachs."

In many ways, the nutritious diet serves as the basis for the success of the New Zealand Antarctic research program.

At present the base is stocked with 1000 pounds of chicken, 200 pounds of turkey and goose, 400 pounds of fillet steak, tongue, liver and tripe, 850 pounds of ham and bacon, 220 pounds of oysters and other seafood and 1600 pounds of butter. There are also stocks of canned fruits, nuts and vegetables.

When Scott Base summer workers speak of "salad days,"

they mean what they say—the days when they can enjoy crisp lettuces, tomatoes and crunchy cucumbers freshly flown from New Zealand.

Like the United States Operation Deepfreeze, the New Zealand program this Antarctic summer has been hampered by bad weather. Deepfreeze flights have been fewer and ships have taken longer to break thick ice to reach the two countries' Antarctic headquarters in McMurdo Sound.

Fresh food has had to give way to more important cargoes in the competition for freight space. But the main base resupply arrived as usual, this year on the new Antarctic supply ship *Endeavour*.

It is all far different from 60 years ago when Capt. Robert Scott's first expedition spent two years of gastric misery at Hut Point only two miles away from Scott Base. Scurvy, the dread disease caused by vitamin C deficiency, plagued the expedition.

SOUTH AFRICA RAISES DOGS FOR ANTARCTIC

PRETORIA, South Africa (UPI)—One hundred fifty miles south of the Tropic of Capricorn, the South African government is running an unlikely but flourishing new industry: raising husky dogs for Antarctica.

The dogs are needed for South Africa's national Antarctic expeditions. The Onderstepoort agricultural research center north of Pretoria has been replenishing the supply of huskies for Antarctic sledge teams.

The first two huskies, Bidule and Fatima, were a gift from the 1960 Belgian Antarctic expedition to Hannes la Grange, who led South Africa's first expedition to Antarctica. Mr. La Grange handed the dogs over to the government to build up a reserve of huskies for future expeditions. Fresh blood was brought in when seven fully-grown dogs were imported from Greenland.

In the climate of South Africa huskies can live up to 15 years. But in the howling gales and blizzards of Antarctica the husky's average life span is five years. Because of this there is a constant drain on the animals and sledge teams have to be replaced regularly.

New Zealand Base Colder

WELLINGTON, New Zealand—New Zealand's Scott Base in Antarctica average about 10 degrees colder than the United States base at McMurdo, the average in winter being about 25 degrees below zero. The minimum so far has been 60 below.

Digging Way Down in Antarctic

New York Herald Tribune

WASHINGTON, June 24

While the Soviets push further and further into space, they have not forgotten the importance of digging deep into the earth for scientific information.

A Soviet glaciologist, Nartis Barkov of the Institute for Arctic and Antarctic Research at Leningrad, says he has designed a drill which will probe almost 2½ miles into the deep ice cap covering Antarctica. American scientists, who have been stymied for two years in making such a drill work, don't believe Mr. Barkov's drill will do the job. They cite all sorts of technical problems.

However, if the device does work it will dredge up natural history perhaps 100,000 years old. It will give important clues to the nature of life, the composition of the earth's atmosphere as well as the planet itself and a record of the weather during prehistoric times.

Although no one in official capacity has mentioned this yet, it could give the Soviets a good claim to part of the continent. Neither the United States nor the Soviet Union has claimed any part of the Antarctic yet.

Mr. Barkov's drill, described by Tass in a recent radio broadcast from Leningrad monitored in the West, consists of an electrically heated tip or "capsule." The cap-

sule simply melts the ice as it is lowered on a cable. Remote controls enables scientists to follow the process from the surface.

The Soviets said they tested "the fundamental principles of thermal ice drilling" at their Mirny station in the Antarctic and have "fully confirmed preliminary calculations."

American scientists working on similar programs were less circumspect. They detailed an imposing set of problems.

Dr. Albert P. Crary, who heads the scientific research program in the Antarctic for the National Science Foundation, pointed out that Americans have drilled into the ice and the holes they made have closed over the drill heads as the glacial material drifts.

Now scientists are working on a method of filling the holes with a fluid under pressure to keep them open. While they keep the holes open, they must find a way of lifting cores out of ice.

Each core would contain samples of cosmic dust, bits of entrapped air and perhaps samples of spores and pollen that existed thousands of years ago. The temperature of the core would also tell scientists whether the Antarctic ice is warmed on the bottom by heat coming from the earth.

Anthony Gow of the Army's cold region research and engineering laboratory in Hanover, N. H., had not heard of the Soviet effort. "They haven't told us much about what they're doing," Mr. Gow said.

His organization is working on the Amer-

ican deep-drilling device. So far, its best efforts have been at the Byrd Station in the Antarctic where the scientists brought cores up from 900 feet and in Northwestern Greenland, where they brought cores up from about 1,200 feet.

The American drilling in Greenland was about 120 feet deeper than a test hole the Soviets say they drilled at Mirny. Mr. Gow, who noted the political implications, said he thought the Soviets would not get cores with their method but would only bore as deep as they could without bringing up any material. (A treaty now reserves the Antarctic for peaceful purposes for at least 30 years and neither the Soviets nor the Americans recognize claims made by several other countries to parts of the continent.)

Gilbert Dewart, a seismologist of California Institute of Technology, spent the winter of 1960 with Mr. Barkov at Mirny as an exchange scientist. He remembers the Russian as an assistant glaciologist in his 30's. Beyond that, Mr. Dewart said, he did not know the Soviets had such a drilling program.

Compared to the race to land men on the moon, it would be exaggerated to call the deep-hole program in the Antarctic a point of Soviet-American competition. Dr. Crary said the U. S. is spending only about \$200,000 on it.

"It's not a crash program," he said, "but we're pushing it awfully hard. And actually, I'm a little bit embarrassed. We had hoped to have it done by now."

Antarctic Expedition

How many seals are there along the route of the polar expedition ships to Antarctica? How far has Britain's most isolated Antarctic station moved in the past year under pressure of the ice mantle covering the South polar continent? What effect do ice floes have on the movement of waves?

These are some of the questions to which a party of youthful scientists and technicians who left Southampton early in December in the motor vessel *Kista Dan*, hope to find the answers.

Sir Vivian Fuchs, Director of the British Antarctic Survey, saw them off. He will be flying out to join the ship at Montevideo.

Later on he will transfer at Deception Island to the Royal Research Ship *Shackleton* and go deeper south to find out how other young British scientists fared during their first year in the Antarctic.

Some of the scientists who sailed in the *Kista Dan* will help to explore the Tottan Mountains in Coats' Land.

This is a range discovered by Sir Vivian Fuchs during an aerial survey before his Commonwealth Trans-Antarctica Expedition.

During the coming months mounds of supplies will be set up along the route to be taken by an expedition to the Tottan Mountains during the Antarctic summer, which begins next October.

This expedition will travel by dog sledge, motor toboggan, and tracked vehicles to map uncharted routes and to study the geology of the area.

During 1963 the *Kista Dan* will be nosing her way through the ice to Halley Bay, the most southerly of the British bases. On the voyage 25-year-old zoologist Michael Thurston will take a census of seals.

Michael, whose home is in Southgate, London, says the job will be no light task, for the world population of the most common species—the crab-eating seal—is estimated at 5,000,000.

He hopes to see some of the rarer varieties, such as the Leopard and Ross seals, and to study the Emperor Penguin. Youngest member of the expedition is 20-year-old Andrew Champness, of Guildford, Surrey, who won the Duke of Edinburgh's Award for an expedition to the Scottish Highlands.

Another youthful enthusiast is Colin Dean, of Eastbourne. He is a physicist, and during the voyage he will be using a wave-recording machine to measure the effect of sea ice on wave motion.

Milne Samuel, young surveyor with the Scottish Ordnance Survey Office, has been given leave of absence to broaden his experience. If he has time he hopes to write a detailed account of his experiences and do some mapping.

Among the stores being sent in the *Kista Dan* is a piano—probably the first to be sent to the frozen wastes of the deep south.

Boulder Laboratories of the National Bureau of Standards is looking for physicists and electronic engineers to spend 12 to 18 months in its Antarctic research program. William S. Hough, who is on the staff of the Laboratory, said the recruiting program is being pushed with utmost speed. The recruits after a short training period at Boulder will leave in November for the Antarctic. NBS research projects in the Antarctic are a continuation of those which were begun

during the International Geophysical Year and will lead to the program known as the International Year of the Quiet Sun.

1100 Ft. Sea Dives By Seals

Sea dives to 190 fathoms have been recorded in the Ross Sea by workers at the biological laboratory at M'Murdo Sound. The scientist in charge of the project is Mr. A. L. de Vries.

The depths were recorded by Bourdon pressure tubes fixed to the seals' backs. The work was undertaken to try to account for the fact that some very large fish, known to be caught by seals, have never been caught by scientists.

The depth reached by the seals was totally unsuspected by the experimenters—so much so that the first Bourdon tubes used had a maximum depth indication of 100 metres. The seals took the apparatus to a depth where the tubes collapsed, and another set had to be brought in.

The seals were caught at random in the wild and had the tubes fixed to them. They were then allowed to go free and a watch kept over a wide area for their reappearance.—Reuter.

Penguin Navigation Puzzles Probers

By Albert E. Norman

Australia-New Zealand Correspondent of The Christian Science Monitor

Sydney, Australia

There's no place like home—especially to an Adelie penguin.

Home, in this case, is the coast of the Antarctic, and this little flightless bird will walk patiently—one six-inch step at a time—hundreds of miles to reach it.

But the question that puzzles scientists is: How does it know in which direction to walk?

Two American scientists, working in the Antarctic under a National Science Foundation grant, recently completed a two-year study of the navigational powers of the Adelie penguin.

These University of Wisconsin researchers, Dr. J. T. Emlem and R. L. Penney, were based at the Australian station in Wilkes Land in western Antarctica.

Dr. Emlem, a widely known ornithologist, said that when penguins were released inland on featureless plains in the Antarctic, they were able to select the shortest route to the coast. The distance from the coast at time of release did not seem to make any difference to their ability to find the route, even when the distance was 600 miles.

The American scientists said that when the sun was obscured by overcast, penguins were less efficient in navigation. This suggested they needed the sun as a directional aid. But the sun alone would not be a sufficient guide. If the birds fol-

lowed it without correction for the earth's rotation, they would navigate on a curved line.

But since it was evident the penguins could travel in a straight line, it was clear they were able to make a correction for the earth's rotation in relation to the position of the sun.

How were they able to do this?

The American scientists decided the penguins possessed a built-in physiological "clock" which enabled them to adjust their course in relation to the movement of the sun. The "clock" would indicate where the sun should be in relation to the required course.

The theory that penguins consult "clocks" in order to move around the country with precision would be something new, but it seems they have been doing this for quite a time, if the American scientists' conclusions work out right.

No penguin was allowed to peek at the sun prior to the Americans' navigational tests. The scientists dug pits in the snow to hold the penguins and covered these with muslin so they could not see the sun.

Then when all was ready, the penguins were "demuslined" and had to get out and start navigating correctly—really, a pretty stiff test for any navigator under examination.

In one earlier experiment, several banded penguins had

been taken from their rookery near Wilkes Station to McMurdo Sound and released. Months later a number showed up at their old rookery, which meant these flightless birds had traveled some 2,400 miles around the Antarctic coast, averaging about eight miles a day.

Pebbles

NEW YORK (UPI) — Pebbles are hard to find in the frozen wastes of Antarctica because penguins regard them as status symbols.

Roger Caras, a young movie company executive who was unable to satisfy a thirst for adventure which began in his childhood, made this observation during a recent trip to the South Pole.

"A penguin without a pebble doesn't have a chance with a female," Caras said in an interview.

"The male penguin puts the pebble near the feet of the female," he said. "If the female puts her beak near the pebble the male becomes elated."

When the female picks up the pebble, Caras said, she is accepting the male in the same manner in which a woman takes an engagement ring from a boy friend.

Occasionally another male penguin will steal the pebble during the wooing, Caras said.

"When this happens, the male will take off in pursuit of the villain," Caras said. "Other pen-

guins will gather and make noises in cheering the hero. But later they will try to steal pebbles themselves. Penguins are hypocrites."

Caras said penguins and seals are not shy around humans because they have no natural enemies in Antarctica. Penguins are so friendly, he said, they eventually become a nuisance.

"It's nothing unusual for someone to wake up and find a penguin staring him in the face," Caras said.

Caras said the greatest hazard facing men in the Antarctica is fire.

"There is practically no humidity down there and everything is dry," Caras said. "If a big wind is blowing and a fire starts it will burn down a building in 30 seconds. Nobody has a chance of getting out."

Only about eight inches of snow falls each year around the South Pole and scientists have dug down into layers deposited more than 10,000 years ago, Caras said.

"They found bacteria in those layers," he said. "They were dormant when brought up but when they were put into a warm culture they began wiggling around. Scientists may find bacteria that caused diseases among the dinosaurs."

Caras has recorded his observations in a recently published book called "Antarctica, Land of Frozen Time." It is not only interesting as an adventure but also a valuable reference book because it contains a list of all Antarctic expeditions up until 1955 and the text of the 12-nation Antarctic Treaty, which includes the United States and Russia.

Soviet Tractor Train At South Pole Base

Moscow, Feb. 19—(AP)—A Soviet tractor train has arrived at the Russian station of Vostok near the South Pole, Tass reports.

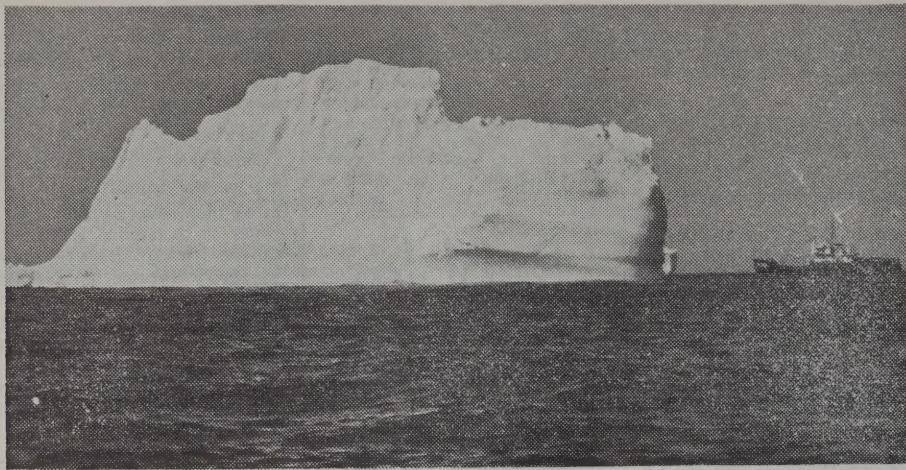
The five tractors hauling sleds covered the 800 miles over the ice and snow from the Antarctic station at Mirny in about a month. Manned by 13 men, the train carried supplies and scientific equipment.

Skua Bird Lives in Antarctic

The skua is the world's southernmost bird, The National Geographic Magazine says. The gull-like bird lives on the coast of Antarctica. For unknown reasons it sometimes flies hundreds of miles inland toward the South Pole.



Adelie penguins from the large rookery at Cape Crozier, eastern extremity of Ross Island.



The Cutter Evergreen, an oceanographic vessel, warily steams up to a berg. Besides warning of drifting ice, patrol ships gather scientific data about it.

50th Ice Patrol Begins Search For Hazards in Atlantic Lanes

The New York Times

June 2

A powerful far-ranging Coast Guard aircraft winged over the North Atlantic off Newfoundland last week scanning the often fog-shrouded waters below for signs of ice.

Below, the buoy tender Evergreen steamed along on her fourth oceanographic cruise in the cold Labrador Current at the eastern edge of the Grand Banks.

This aerial and surface activity was a sign that the 50th International Ice Patrol was well under way. The annual hunt for the seasonal ice hazard in the busy trans-Atlantic shipping lanes is undertaken each year by the Coast Guard under international agreements.

Coast Guard sources said here last week that the current ice season was one of the mildest on record in recent years. An average of 85 icebergs a month, they said, drifted into the shipping lanes during the 1950-1962 period, compared with only 20 last month.

As a result, it may be possible to discontinue this year's patrol earlier than the customary date of July 1, they added.

The Current Ice Patrol season started officially on March 6 when patrol headquarters at Argentina, Nfld., sent out the first of its twice-daily reports on the ice station. These messages inform shipping of the whereabouts of large bergs and smaller ice masses.

Fifty years ago, the Revenue Service cutter Seneca put out to sea from Halifax, N. S., to patrol these foggy waters for the first time. The service was the predecessor of the Coast Guard.

The initial patrol was prompted by one of shipping's most disastrous accidents—the loss a year earlier of the British liner *Titanic*. The \$7,000,000 liner sank with the loss of more than 1,500 lives after striking an iceberg.

The patrol's objectives, unchanged throughout the years, are to observe the movements

of glacial ice into the vicinity of the Grand Banks, where they menace trans-Atlantic and other shipping.

Coast Guard officials noted that the current activity season was only the 45th annual patrol. For two years during World War I and for three years during World War II it was impossible to conduct the annual search.

The patrol depends primarily on aerial observation of ice hazards. For the first time, new Lockheed HC-130B planes are being used this year. These are large, four-engined turbo-prop planes with greater speed and

Atlantic Ice Patrol to Expand Warning Services Next Season

The New York Times

June 22

The Coast Guard is about to make far-reaching changes in the organization and operation of the International Ice Patrol.

The patrol closed its 50th anniversary season on Thursday after one of the lightest ice-hazard periods for trans-Atlantic shipping in recent years.

The patrol's reorganization, according to Coast Guard sources, has two objectives—to improve and expand the patrol's ice warning duties and to strengthen the service's contribution to the national oceanographic effort.

The permanent patrol headquarters will be moved on July 1 to Argentina, Nfld., from Woods Hole, Mass., where it had been since 1959. The Argentina Naval Station is the patrol's command post during the patrolling season, which normally lasts from February to July.

Patrol headquarters are being shifted, the Coast Guard explained, to provide year-round aerial scouting in the Gulf of St. Lawrence and in Arctic waters where ice is a permanent navigational hazard.

The Coast Guard expects, for instance, that the annual Arctic resupply missions of military bases will benefit greatly. These missions are undertaken by the Navy's Military Sea Transportation Service.

Aerial ice surveillance on a year-round basis will be furnished by the Coast Guard air detachment at Argentina. The detachment has two C-130 Hercules aircraft. Its primary mission is search and rescue work.

While the six-man permanent Ice Patrol staff will be sent north to Newfoundland, seven oceanographers will be moved from Woods Hole to Washington. There they will join a larger group of Coast Guard experts

longer range than the R5D aircraft (military versions of the DC-4) employed in former years.

Supporting the aircraft are two large ocean-going tugs that can be called into service on 72-hour notice if poor visibility prevents aerial surveillance of a berg. The last time surface patrolling was needed was in 1959.

The tender Evergreen, for the second year in a row, has put out three special survey buoys. The buoys are floating laboratories designed to record such data as characteristics of currents, water temperature, wind velocity and the heat output of the Southward-flowing Labrador Current.

In addition to the twice-daily broadcasts on ice conditions, the Coast Guard is also to transmit daily radio facsimile charts. Ships equipped with facsimile receivers have been asked to mail in for evaluation copies of the charts that they receive.

To help the patrol, shipmasters in the area bounded by Lat. 39 to 49 degrees N. and Long. 42 to 60 W. have been asked to furnish every four hours data on their position, course, speed, visibility, sea temperature and weather conditions.

Shipmasters have been warned again by the Coast Guard not to place too much dependence on radar sets to detect floating ice. They have been told that radar is a valuable aid but "cannot replace the traditional caution exercised in a passage across the Grand Banks during the ice season."

in the service's newly established oceanographic unit at the National Oceanographic Center.

The center, at the old Washington Navy yard, is staffed by specialists of several Federal agencies. These include the United States Weather Bureau, the Naval Oceanographic Office, the Smithsonian Institution, the Bureau of Commercial Fisheries and the Coast and Geodetic Survey.

The center will be the headquarters for a major drive to unlock the secrets of the vast ocean domain.

During the ice season, personnel of the oceanographic unit will be assigned to the patrol's oceanographic survey ship. Whenever the ice season is more severe than usual, an officer may be assigned as assistant ice operations officer and ice observer upon request by the patrol commander.

The current patrol season, which ended last week, was described as "very light." About 200 icebergs, or only half the number in an average season, were said to have drifted into the Atlantic shipping lanes. None drifted far south.

As a result, it was not necessary to assign a surface unit to "ride herd" on floating ice. All ice search work was performed by aircraft.

FIRST SUPPLY SHIP LEAVES FOR NORTH

Skin-Diving Team Is Aboard to Check Arctic Oil Lines

The New York Times

June 2

The small motor vessel Redbud, the advance party of the Navy's Military Sea Transportation Service's 13th annual Arctic supply operation left port Monday.

Her sailing was the first in a large number of icebreaker, tanker and dry cargo ship movements to northern waters to ferry 2,500,000 barrels of petroleum products and 116,000 tons of cargo to installations in Labrador and Greenland.

Aboard the 180-foot Redbud, a combination icebreaker light cargo vessel and radio communications ship, is a civilian skin-diving team. Its assignment is to check and put into operation discharge lines for oil products. It will also reactivate aids to navigation and submarine ice prevention equipment at special piers.

The Redbud's first port of call will be Harmon Air Force Base in Newfoundland. She will then go to Goose Bay, Labrador, where on June 15 the Coast Guard icebreaker Westwind will help her smash in to that port. The icebreaker left here yesterday.

On July 5 the small but versatile craft is expected at Sondrestrom, Greenland, and at Thule, Greenland, 5 days later. She will lead a convoy of tankers into these two ports with an assist from the Navy tanker Chattahoochee.

A total of 11 tankers, eight dry cargo ships and two Navy icebreakers, the Edisto and Atka, have been earmarked for service in Task Force 6. The task force is under operational control of Rear Adm. Frank L. Johnson, commander of the service's Atlantic area.

As in years since 1950 when the first supply operation took place, the task force will be supplemented by Army longshoremen for over-the-beach unloading of military supplies.

Special features of this year's mission include training cruises for midshipmen aboard the Coast Guard icebreaker and Navy icebreaker Edisto.

For the first time since 1950, M.S.T.S. will employ civilian personnel to coordinate activities from the northern ports. One Arctic civilian representative each has been assigned to Goose Bay and to Thule.

One task will be to maintain liaison with Danish forces in Greenland, commanded by Rear Admiral Jorgen Munter, Admiral Johnson said.



Adm. F. L. Johnson

Adm. Johnson succeeded Rear Adm. James C. Dempsey as area commander on March 1. He began his Navy career in September, 1925, as an enlisted man. A year later he was appointed to the Naval Academy.

As Commander of the Military Seas Transportation Service Atlantic Area he is responsible for rushing nearly 100,000 tons of cargo and 2.5 million barrels of fuel to the nation's Arctic bases in 143 days.

The supplies, everything from baby food to bullets, must be unloaded before the harbors are frozen solid. Most will be used at the Strategic Air Command Base at Goose Bay, Labrador, and the Atlantic Defense Command bases at Thule and Sondrestrom, Greenland. Some will be left for the DEW Line (Distant Early Warning) sites at Itivideq and Kulusuk, Greenland.

The Westwind will carry a crew of 14 officers and 183 enlisted men. Also 24 cadets from the United States Naval Academy and the Navy's Reserve Officers Training Corps for introduction and training in Arctic shiphandling, survival and operations activities.

Among her major assignments, the Westwind will report preliminary surface ice reconnaissance; clear the way for MSTS ships entering Sondrestrom Fjord Harbor; Goose Bay, Labrador, and Thule, Greenland, and deliver some of the necessities of life to isolated outposts along the DEW (Distant Early Warning) stations. Canadian Mounted Police, Canadian Weather Stations and isolated Eskimo villages.

Commanded by Capt. Robert

Tours to Follow Arctic Explorers

The Christian Science Monitor

Tromso, Norway

Three 15-day-long tours, starting from this city located a third of the length of Norway above the Arctic Circle, will follow the routes of Byrd, Ellsworth, and Amundsen to Spitsbergen and on across the drifting pack ice to within a few hundred miles of the North Pole this summer.

Led by the famous Polar explorer, Capt. Finn Ronne, now retired from the United States Navy, they will be made aboard the motorship Norsel, a veteran of 10 South Pole expeditions.

Pegged at an all-inclusive cost of \$1,400 per person, with no shipboard or shore excursion extras, the unique cruises are scheduled to depart from Tromso on July 6, July 21, and Aug. 5. Tromso is reached by air from Bergen or Oslo.

The Arctic midnight sun will be shining when the Norsel sails at night from Tromso, through the island-sheltered inside passage and on into the Norwegian Sea. On the third day, Bear Island, midway to far-north Spitsbergen, will be reached in the afternoon. Launches will take passengers ashore to visit the weather station, to fish, or hike across the island.

On the fourth day, the cruise will be in the Greenland Sea, along the shores of west Spitsbergen, allowing an imposing view of the Torelbreen glacier, surrounded by jagged mountain peaks. The Arctic settlement of Ny-Aalesund, on Spitsbergen's King's Bay, will be reached on the morning of the fifth day. In addition to magnificent scenery, Ny-Aalesund boasts the northernmost post office in the world.

The night will be spent anchored in Magdalena Fjord, once an important whale-catching center, with a shore excursion to a nearby glacier.

Leaving Spitsbergen on the morning of the sixth day, the Norsel will sail across the 81st parallel and into the pack ice that stretches along the Spitsbergen coast. The next after-

F. Barber, USCG, who will be making his first trip north as skipper of the ship, the Westwind also will take part in oceanographic studies and make tests to assist the David Taylor Model Basin of Maryland in its work on the design of a new class of icebreaker.

Part of the Westwind's equipment will be two Navy helicopters that will serve as the eyes of the ship in spotting weak areas of ice.

noon, Welcome Point, in Wood Fjord, will be reached, an area where majestic mountains and glacier faces rise almost perpendicularly out of the blue-green waters.

From Wood Fjord, the cruise will go briefly back into the pack ice that stretches almost unbroken up to the top of the world. The Norsel will be the first passenger-carrying vessel ever to venture this close to the North Pole.

Swinging southward, down across the 80th parallel, still on Spitsbergen's west coast, the cruise, on the eighth day, will enter Ice Fjord to sail past King Karl's Forland, the center of mining, trapping, and government in the archipelago.

Next day will be spent in Sassen Fjord, with an excursion ashore to the Sassen Valley and the camp of Hilmar Nois, a hunter and trapper who has spent the last 39 winters in Spitsbergen. The 10th day of the trip will be spent ashore at Longyearbyen, home of Spitsbergen's Norwegian Governor, and visiting the local coal mines and tax-free stores.

Spitsbergen will be left behind on the 11th day, as the cruise moves round the island's South Cape and heads toward Hopen Island, with its many polar bears, in the Barents Sea. Honningsvag, on Norway's North Cape, is reached at noon on the 13th day. From there the trip back to Tromso is made by motorcoach, with a night stop en route at Hammerfest, the northernmost city in the world.

At noon on the 14th day, the return is made to Tromso, with afternoon visits planned to the Arctic Museum, the Rockefeller Auroral Observatory, and an excursion by cable car to the top of nearby Floyen Mountain. Departure from Tromso by air is scheduled for the morning of the 15th day.

For those interested in further fjord cruising, however, three seven-day-long post tours, leaving Tromso on July 20, Aug. 4, and Aug. 19, are optional, at a cost of \$230, to Norway's Geirangerfjord, Nordfjord, and Sognefjord with a stopover in Bergen.

Volcano Erupts in Alaska

ANCHORAGE, Alaska, April 1 (AP)—A volcanic eruption was reported today 300 miles southwest of here, apparently in Alaska's Valley of 10,000 Smokes in the Katmai National Monument. A mushrooming cloud was seen 100 miles away. No one was reported in the region of the Alaska peninsula where the eruption took place.

Romance of Whale Hunt Yields to Efficiency

'Moby Dick' Image Erased by Modern Harpooner's Art

By CLYDE H. FARNSWORTH

The New York Times

LONDON, June 30—Whaling has come a long way since the days when the Pequod hunted the white whale, Moby Dick.

The attack in an open boat in which one man tossed a harpoon at a leviathan that could weigh 100 tons went out in the late 19th century after the harpoon gun and explosively capped harpoon were invented.

Today, whales are killed in a far less romantic and dangerous fashion by ships known in the trade as catchers, which operate from a factory ship where as many as 50 whales can be processed in 24 hours.

These floating factories work for the most part in the Antarctic, where 70 per cent of today's whales are killed, and remain in these waters for a season that normally lasts from November to April.

In the 1962-63 season, 16,732 men worked in the Antarctic on 17 factory ships, 201 catchers, 19 refrigerating ships and 34 meat transport ships, according to the International Bureau of Whaling Statistics of Oslo, Norway.

It's all rather cut and dried, and today the chief concern is not how to kill whales but how not to kill so many.

Scientists met last week in London to complete a study on population and preservation of the mammals. They will submit the study on Monday to the International Commission on Whaling.

The commission, which is



Currier & Ives print depicts an 18th century whale hunt off the coast of South America

holding its annual meeting this week, was established after a 1946 whaling convention in Washington and provides the means for "exploitation without destruction" of the whale stock.

For some years there had been the fear in scientific and conservation circles that unrestrained killing of whales would mean these creatures would go the way of the North American bison or the duck-bill platypus.

There are presently 18 signatory nations to the whaling convention, including the United States and the Soviet Union.

They agree to abide by quotas established by the commission for the catch each year. For the 1962-63 season just ended the quota was 15,000 blue whale

units. This is a measure that relates the major types of whales to the oil yield from the huge blue whale, the largest form of life ever known on earth.

Although an average of 30,000 whales has been killed annually since World War II, and although killing and processing now is highly efficient, whaling is not, and never really has been big business.

Aside from the Soviet Union, there are today only four other nations in which there is an important whaling industry. These are Norway, Japan, the Netherlands and Britain.

And in terms of overall economic importance, whaling is of minuscule proportions in the

Netherlands and Britain. There is only one whaling company in Britain, a Scottish concern in Leith.

Whaling boomed in New Bedford in 19th century America but there is for all practical purposes no whaling industry in the United States today.

Much of the incentive for whaling has gone. The two most important whale products, oil and meat, do not command a high price on the market. Whale meat, for example, sells for about half the price of beef, and is not particularly sought after, even though food experts claim it can be prepared delectably. It was eaten widely in Britain during World War II, and is still eaten widely in Japan.

Norway's Whaling Boats Return After Poor Season

The four Norwegian expeditions that participated in the 1962-63 Antarctic whaling season returned home with poor results, according to News of Norway, an official publication.

Altogether, they processed 224,645 barrels of oil (about 37,441 tons), including 183,345 barrels of whale oil and 41,300 barrels of sperm oil. In the preceding season, the same four expeditions produced 365,154 barrels of oil (about 60,859 tons).

One reason for the drop was that the factory ship Sir James Clark Ross was under repair during the 70 days of the 117-day blue whale season. Also the expeditions had only 32 catcher vessels, as against 43 in the 1961-62 season.

Norwegian whaling companies sold 30,000 tons of their whale

Antarctic Whales Found in Peril

By the Associated Press

Nanaimo, B.C.

Gordon Pike, a member of the scientific committee of the International Whaling Commission, says whales will be extinct in the Antarctic in the next five to 15 years unless whaling methods change.

If they continue to be caught at the present rate—particularly by the Russians and Japanese—there will be none for commercial use, he says.

oil production in advance. The prices obtained ranged from about \$150 a ton to about \$180 a ton. Total advance sales of whale oil amounted to about \$7,200,000. Additional income may be derived from sale of the sperm oil, frozen whale meat and whale meal.

BRITISH SALMON GO TO ARCTIC TO SPAWN

LONDON (Science Service)—British-tagged salmon have been recaptured 2,000 miles from home, as far away as Greenland and the Arctic Circle.

Very long distance migrations are more common than was earlier supposed, according to Dr. A. Swain and W. G. Hartley of the Freshwater Fisheries Laboratory in Whitehall Place, London, and Dr. R. B. Davies of the Central Electricity Generating Board in Cardiff.

"Whether fish that have traveled so far would normally return to their native rivers to spawn is, of course, still unknown," they report.

Particularly interesting, they point out, is the recapture of a salmon near Kangamiut, a

small settlement just outside the Arctic Circle. It was tagged as a smolt after entering the cooling water system of the Uskmouth Generating Station near Newport, England.

In 1956 a salmon tagged in Scotland was recaptured in Egalug Fjord, on the west coast of Greenland. A salmon tagged as a smolt in the estuary of the Miramichi River, New Brunswick, Canada, in 1960 was recaptured on the southwest coast of Greenland and more recently another Canadian salmon was captured in the same area.

These tagging operations show that salmon from both sides of the Atlantic can appear together in the coastal waters of Greenland at some stage during their marine life.

Salmon normally spend half their lives in the ocean and the other half swimming up the fresh rivers to spawn.

WHAVERS' RETURN FESTIVE IN JAPAN

Six-Month Cruise Followed
by Gay Reunion on Ship

By A. M. ROSENTHAL

The New York Times

TAURA, Japan.

The Nisshin Maru, third of her name, returned to Taura recently, six months and 760 whales out of her home port. In a matter of hours, the decks of the ship were bright and gay with tall welcome-home wreaths and small fat babies.

Early in the morning of her arrival the directors of the Taiyo Fishing Company, owners of the ship, began gathering at dockside. They took a small launch out to the vessel, climbed on board, bowed to the officers and then went below to toast the success of the journey in the captain's quarters.

Discreetly behind them came launches full of wives, some of them carrying infants who had never seen their fathers. All through the morning and into the afternoon, there were parties on board the Nisshin Maru III. Men who had sailed and worked together in the waters of the Antarctic for months introduced each other to their shy families.

The decks where the great whales had been dragged from the seas to be cut and hacked were glisteningly fresh. Below, the block-long factory deck filled with towering oil vats was dark, silent and almost as clean as a hospital ward.

The Nisshin Maru III a vessel of 23,400 tons that cost \$8,000,000 to build and equip, is the mother ship of one of seven Japanese whaling fleets. Together, they make Japan the most important whaling nation in the world and earn an income of almost \$46,000,000 a year.

It was in November that the Nisshin Maru III set out on her journey, trailed by eight "catcher boats" about half her size, two refrigerator ships and a whale-oil tanker. On board the factory ship were 104 officers and crew members and 298 factory workers whose trade it is to reduce the giants of the sea to blubber, oil and ground meal.

Every day in Antarctic waters, the great stern of the ship swines, opened to receive the whales caught by the explosive-powered harpoons from the catcher ships. Huge winches dragged the whales up a ramp onto the deck.

The meat of the whales was transferred to the refrigerator ships. What remained was sent below to the factory deck's tanks, where crude oil was boiled out, stored and then transferred by pipe to the tanker, capable of carrying 15,

Willard Van der Veer, 68, Dies; Photographed Byrd Expeditions

ENCINO, Calif., June 16 (AP)

—Willard Van der Veer, a newsreel cameraman and photographer with Adm. Richard E. Byrd's Arctic and Antarctic expeditions in the nineteen-twenties, died of a heart attack today in his home. His age was 68.

In recent years Mr. Van der Veer had been with a television movie company.

Mr. Van der Veer was the first person to photograph both poles. His pictures and those of his partner in the South Pole expedition, Joseph Rucker, were made into a documentary and released by Paramount-Publix here in 1930.

The film was described in The New York Times as "a great picture, one that captures the eye from beginning to end." For this work the Paramount cameraman received an Acad-

emy Award for the best cinema photography of the year.

Admiral Byrd, Mayor James J. Walker, the White House and filmmakers paid tribute to their work. Admiral Byrd cited Mr. Van der Veer's courage, devotion and enterprise in shooting more than 100,000 feet of film under "impossible conditions."

Admiral Byrd told how the two cameramen had gone out in 60-degree-below-zero weather with Antarctic gales to take pictures with frozen equipment. "Icebergs," he said, "seemed to hem them in their frozen grip." A representative of President Hoover said the White House was "proud."

Before the Byrd expeditions, Mr. Van der Veer was a Signal Corps photographer in World War I.

He is survived by his widow, Edna, and by a son.

000 tons of oil.

Once full, the tanker proceeded to Europe to unload the oil, which will be used in the manufacture of soap and margarine. The refrigerator ships, when they had their cargo, headed back to Japan, where there is a steady demand for whalemeat, a market that has helped give dominance in the whaling industry to Japan.

The five major whaling nations—Japan, Norway, Britain the Soviet Union and the Netherlands—operate under an international agreement, a result of intensive haggling. The agreement fixed the world catch at 15,000 whales this year.

Most of the whales are caught in the Antarctic. Seventeen fleets operated in the Antarctic this year and caught 11,300 whales. Japan topped the list with 6,150, more than the combined total of the Soviet Union, Norway, Britain and the Netherlands.

Most of the 120,000 tons of whale meat brought back by the refrigerator ships of the Japanese fleets will be processed and solid in Japan.

Officers' quarters on the factory ship are as spacious as cabins in many passenger liners. Quarters for crew and factory workers are considerably more comfortable-looking than on many freighters and by Japanese wage standards whaling is a good job.

For the six-month voyage, top officers received about \$3,000 and some crew members about \$1,500. Factory workers hired for the voyage received about \$900.

All the visitors to the Nisshin Maru III brought gifts—bottles of sake, or packages of home-prepared delicacies. And in the huge galleys the cooks had prepared for the crew, the factory

THOMAS F. SMELLIE, ICEBREAKER CAPTAIN

The New York Times.

VANCOUVER, B. C., April 15 — Capt. Thomas Farrar Smellie, for many years master of the Hudson's Bay Company's icebreaker Nascopie, died here yesterday at the age of 83.

Captain Smellie who retired in 1945, first went to sea at the age of 9, when he signed on his father's ship as ship's boy on a voyage to St. Petersburg (now Leningrad). He served in sailing ships seven and a half years.

In 1917, Captain Smellie was assigned to the Nascopie to take supplies from Montreal to Archangel. After World War I he began annual journeys from Montreal with supplies to Hudson's Bay posts in the Arctic. His ship was so overloaded at times, he once said, "it was the only ship that listed on both sides at the same time."

The Nascopie carried not only supplies for the stores but also the stores themselves, the men to erect them and the coal to heat them.

Captain Smellie was a holder of the Order of the British Empire.

Dr. Carl Skottsberg, Botanist Headed Swedish Academy

Dr. Carl Skottsberg, former president of the Swedish Academy of Sciences and once a guest professor at Yale University, died June 13 in Göteborg, Sweden.

Dr. Skottsberg, a botanist, was a member of the Swedish Antarctic Expedition of 1901-3. In 1907 he led an expedition to South Georgia and other islands in the South Atlantic, and he participated in many other such ventures.

In 1919 he founded the Botanical Garden at Göteborg, which he headed until 1948. Two years later he presided over an international botanical congress held in Stockholm.

Dr. Skottsberg taught at Yale from 1934 to 1935.

He is survived by a son and two daughters.

Rex Noville Dies; Polar Explorer, 79

Guadalajara, Mexico, Jan. 4 (AP)—George Otto (Rex) Noville, 72, who accompanied the late Polar explorer Rear Adm. Richard E. Byrd on his flight from New York to Paris in 1927, died yesterday of a gunshot wound inflicted Tuesday.

Noville, a native of Cleveland, was executive officer of Byrd's Antarctic expedition that began in 1934. Authorities said the gunshot wound apparently was self-inflicted.

Barkentine Bear of 1874 Engulfed by the Atlantic

The New York Times Western Edition

March 20

Bested at last by the seas she defied for nearly 90 years, the three masted Barkentine Bear went down in the Atlantic Tuesday night 260 miles east of Boston.

The old ship, called by some seamen the 'toughest' wooden vessel ever built, had encountered trouble a day earlier when a tow line broke as she was being towed to Philadelphia for use as a restaurant and museum piece.

The Bear, built in Scotland in 1874, had been a sealer, a Navy ship under the United States flag, a Coast Guard craft, and ice breaker and an expedition ship for Admiral Richard E. Byrd. She made many rescues of men trapped in Arctic ice.

Two crewmen riding the Bear during the tow were taken off the 198-foot vessel Tuesday on a raft dropped to the towing vessel by an amphibious plane.

The Bear was built by Alexander Stephen & Sons in its yards at Dundee, Scotland, and was completed in 1874. Her ice-crunching bow was made mostly of oak. Her sides were covered with Australian iron bark, the hardest wood known, and her bottom was made of yellow pine.

Her last power was a Diesel engine, but she was originally a three-masted steam barkentine.

First home of the Bear was St. John's, Nfld., and from that port she sailed her first eleven years as a sealer. Her four sister ships—the Tiger, Leopard, Wolf and Lion—were lost in northern waters, and in 1883, the Bear became the property of the United States when Congress authorized \$100,000 for her purchase.

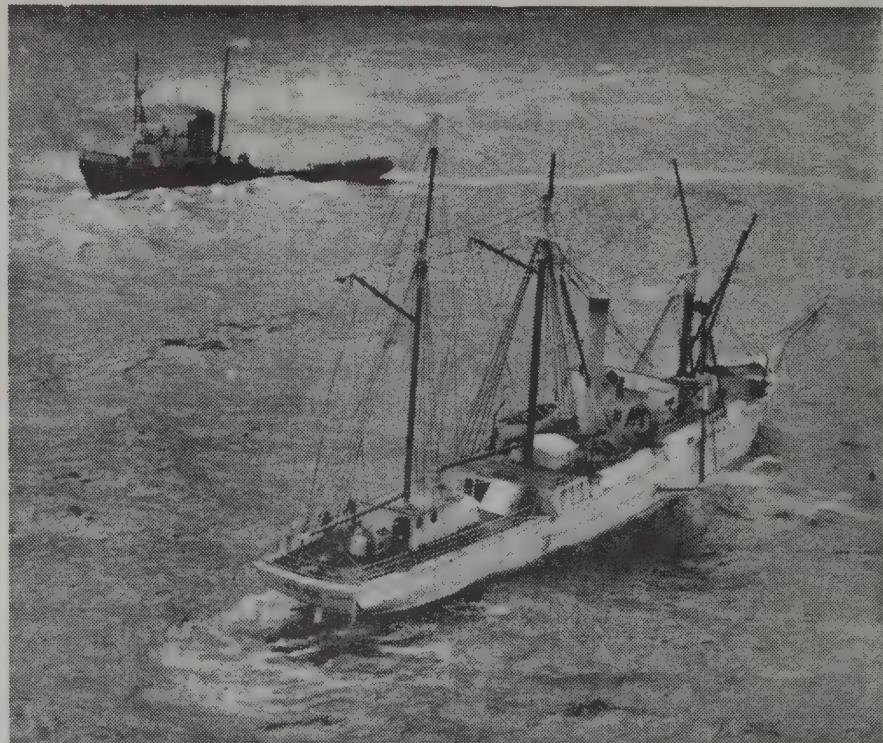
The United States needed her then as it needed her many times later. She was taken to the United States to perform her first rescue mission.

A United States scientific and Army team in 1883 had left for the Brevort Island area to study the earth's magnetism and northern weather. A provision ship, stuck in ice some distance from the other vessels, was crushed. Her hold filled and her provisions were lost. About twenty-five men were stranded on the ice without food or shelter. The Bear battered her way through the ice floes, inching toward the men, and on April 24, 1884, she found seven pitiful survivors.

The rescue was the Bear's first taste of glory. She was wildly welcomed in New York and congratulated by President Arthur. But later in 1884 she was decommissioned.

It was a short rest, however. She returned to work the next year to serve with the Revenue

Famous Old Sailing Ship Near End in Atlantic Storm



United States Coast Guard Photo

The barkentine Bear wallows at sea with two crewmen standing on stern after losing tow

BOSTON, March 19 (AP) — The brave old barkentine Bear — heroine of Polar rescues and at age 59 challenger of the Antarctic with Admiral Richard E. Byrd—seemed near her end tonight in a worsening Atlantic storm.

The 198-foot vessel, said by Admiral Byrd to be the strongest wooden ship ever built, had fallen upon evil years after her World War II service. Sold for fur-sealing, she was found by her new owner, Arthur M. Johnston of Villanova, Pa., all but abandoned on a Nova Scotia beach.

Marine later the United States Coast Guard. She sailed from New York to San Francisco and was ordered almost immediately to the Bering Sea patrol. She was destined to repeat the trip to Alaska more than thirty times.

Her duties in Alaskan waters were to assist whaling vessels, provide medical care and uphold law and order among the natives. Alone in her earlier years, she was the keeper of the North for thirty-eight years.

One of her first jobs was protection of the Alaskan seal herd.

Weary after long patrols in

He planned to preserve her as a historic relic. She was proceeding in the tow of the commercial tug, Irving Birch, when they ran into heavy weather and 30-foot seas 140 miles south of Halifax, 260 miles east of Boston.

The Irving Birch lost her tow. She broadcast urgent distress messages. Two men were on the drifting ship. Two planes responded, one a Coast Guard craft from Salem, Mass. The Coast Guard dropped a lift raft. The two men were floated to the tug.

As twilight fell amid ominous forecasts of worsening weather, the old ship rolled and pitched in the heavy ocean. She was down at the bow and listing to starboard.

1898, she returned to Seattle to learn that eight sailors were locked in the ice off Point Barrow. About 270 men faced certain death unless help arrived. The Bear again battered through ice barriers but was finally stopped 1,500 miles from the trapped sealers.

The Bear's crew, by this time as famous as the ship itself, went over the ice in temperatures some times 70 degrees below zero and reached the trapped men on March 26. They arrived just in time, for scurvy had set in and the Bear's crew could check it. For this venture two of the crew received medals

from Congress.

The Bear joined the Coast Guard in 1915. Sailing off Oregon in 1921, she faced a vicious storm with 150-mile-an-hour winds and mountainous seas. But she rode out the storm, which claimed thousands of tons of shipping.

The Bear made her last trip to the north in the 1920's. Natives and crew members wept openly when she turned and headed south for the last time. She seemed destined for the scrap yard. Instead she was made a public museum at Oakland, Cal., and except for some movie-making, remained there until 1932.

One day in that year Captain Richard E. Byrd, the first man to fly over the Poles, came aboard.

Impressed, he had the Bear purchased and sailed her to Boston to be prepared for more famous voyages. She headed south from Boston Sept. 25, 1933, reaching the Bay of Whales Jan. 31, 1934. For months she sailed through unfamiliar waters charting unfamiliar shores and ocean floors. She explored 500 miles of Antarctica's coast line.

She was again retired in 1939, but war forced her back to work. In 1941-1944 she sailed in the Greenland ice patrols. The Coast Guard gave her up in 1948, when she was sold to the Halifax steamship concern.

MUSEUM SALUTES GREAT EXPLORERS

Exhibition Recalls Exploits Since Peary's in 1909

By SANKA KNOX

The New York Times

Daring exploits that took explorers over the top of the world and into other unknown corners of the earth since 1908-1909 are on review at the American Museum of Natural History.

A new exhibition, "Partners in Discovery," will open today with vignettes of the historic expeditions and voyages.

The show honors pioneers whose ventures were sponsored by the museum and by the National Geographic Society. The tribute also embraces the society, now observing its 75th anniversary.

At a preview June 18, Rear Adm. Donald B. MacMillan told of the voyage that brought the American flag to the North Pole in 1909.

The 88-year-old admiral, who was in a supporting vessel in this historic conquest by Adm. Robert E. Peary, said:

"Many countries tried for years to reach the North Pole, but they all failed. Peary was the only one to take Eskimos with him. That was his secret. Peary reached the Pole on April 6, 1909.

"He said to me, 'MacMillan, if I'm not back by mid-May, leave without me.' He knew that if he wasn't back by then, he'd never get back; the Arctic sea would be choked with ice."

The four Greenland Eskimos who were with the explorer when the flag was planted are shown in photographs in the exhibition along with the flag. There is also, the actual wooden sledge that Peary used and the huskies—now mounted museum specimens—that transported the explorer across the Pole.

The Peary expedition was the earliest exploring venture of earliest exploring venture of the Society. The museum was headquarters for Peary's work, and the still young and not too heavily endowed society dug deeply in its treasury to help finance the exploit.

The show will remain at the museum until next year.

R.E.A. Aids Eskimo Village

NOME, Alaska—The remote Eskimo village of Kotzebue, 30 miles north of the Arctic Circle, has borrowed money from the Rural Electrification Administration and established a light-and-power system. Fuel for the two oil-fired 500-kilowatt generators is delivered twice a year by ocean tanker.

Classic Arctic Explorer

Donald Baxter MacMillan

MORE often than not whenever two or more Bowdoin College men get together for a chat over a hospitable glass, the conversation sooner or later gets around to the day "Gold Old Mac" climbed 130 feet to the top of the college chapel's steeple on a lightning rod.

And then, goes *Man in the News* the story that is supported by college historians, he tied to the top of the lightning rod the banner of the class of '98 and hung on the rod's tip a chamber pot. Or was it a plug hat?

"Good Old Mac" is now Rear Adm. Donald Baxter MacMillan, retired, the Arctic explorer from Provincetown, Mass., at the tip of Cape Cod, who has spent much of his 88 years virtually commuting between Brunswick, Me., and the Arctic on his rugged and picturesque schooner, *Bowdoin*.

Admiral MacMillan will be the guest of honor at the American Museum of Natural History when it opens an exhibition paying tribute to great explorers of the last 75 years who have gone on expeditions sponsored by the museum and the National Geographic Society.

Admiral MacMillan, spry, lean and alert and almost "too busy" to get down to New York to receive his honors, chuckles as he reminisces about the steeple episode.

"Yes," he recalls, "I climbed the steeple on the lightning rod, but the reason I did it was to take down the flag of the class of '97. It had been put up there two days before by a freshman, Charlie Moulton, who became a physician in New Jersey. I took his banner down and put up ours."

And the chamber pot?

"No, it was a plug hat. The chamber pot was one I put on the top of a flagpole in Freeport, Me., when I was living there. Charlie Carr, the druggist, didn't like that, so he shot it down with a rifle."

Admiral MacMillan, who took up both smoking and marriage at the age of 60, is apparently the last of the foot-slogging Far North explorers who had to rely on Eskimos, Eskimo dogs and sledges in the era that preceded Polar exploration by aircraft and nuclear-powered submarines.

He accompanied Admiral Peary on his 1908-1909 trek to the North Pole but had to turn back at the 85th parallel when he broke through the ice in sub-zero weather



The New York Times

Member of dog-sled school

and froze his feet. Peary saved the feet by warming them against his own body.

At 88 he gives between 50 and 60 lectures a winter and spends his spare time browsing through secondhand bookstores in search of old books on Arctic explorations to add to his collection of 3,000 volumes at his home in Provincetown.

"It's the house I was born in," he recalled. "I left it at age 3. My father had been lost at sea, and then my mother died. People took me in. Years and years later I went back and told the owner I would like to buy it back.

"She said she would see that I got it, but then she died suddenly. I asked her sister, who was living there about it, and she said they had spent lots of money on it.

It is a large, white frame dwelling overlooking Provincetown Harbor—the Pilgrims' first port of call in this hemisphere—and he lives there with his wife, Miriam, who is a special story herself.

As a child of 5 she sat on the explorer's knee, listened to his stories of adventure and decided to marry him when she grew up. She did in 1935.

Admiral MacMillan, who was born Nov. 10, 1874, and his beloved schooner retired together in 1960, the explorer to lecture and the *Bowdoin* to serve as an attraction for 100,000 visitors annually at Mystic Seaport, Conn.

Navy Reports Close Call By Polar Subs

By the Associated Press

WASHINGTON, April 27
The nuclear submarines *Skate* and *Sea Dragon* had a brush with disaster in their historic rendezvous at the North Pole last summer, it was disclosed today.

The *Skate* surfaced first, and only a last-minute warning over an underwater phone prevented the *Sea Dragon* from coming up right under the *Skate*.

The executive officer of the *Sea Dragon* at that time was Lt. Comdr. John W. Harvey of Philadelphia.

A little more than eight months later, he was less fortunate. Commander Harvey became the skipper of the atomic submarine *Thresher*. He and 128 other men aboard perished on April 10 when the *Thresher* vanished off Cape Cod.

The rendezvous of the 268-foot *Skate* with her sister sub, the *Sea Dragon*, under the polar ice pack, was announced by President Kennedy Aug. 22.

The Navy said at the time that the *Skate* and *Sea Dragon* had "surfaced together at the North Pole" on Aug. 2. The *Skate* came from the Atlantic, the *Sea Dragon* from the Pacific.

There was no indication in the announcement that there had been a close call.

Information which became available today said the *Sea Dragon* reached the rendezvous position on July 31 a little ahead of the *Skate*.

The two submarines then traveled side by side under water until they reached the North Pole. At that point, the *Skate* surfaced.

Comdr. Joseph L. Skoog Jr. of Seattle, skipper of the *Skate*, then stood on his bridge watching for smoke floats released by *Sea Dragon* from its bow and stern as a signal that it was preparing to surface.

Suddenly a *Skate* lookout reported a smoke float on the starboard beam of his sub. Almost immediately another *Skate* lookout sighted a second smoke marker off the *Skate*'s port beam.

This meant the *Sea Dragon* was coming up underneath and at a 90-degree angle to the *Skate*. The two subs were in the form of a cross.

Commander Skoog leaped to an underwater phone and shouted a warning to Comdr. Charles D. Summitt of Nashville, Tenn., Captain of the *Sea Dragon*.

Sea Dragon swung about and surfaced close to her sister sub.



BERTRAM G. WOODLAND
Curator of Igneous
and Metamorphic Petrology

CHICAGO NATURAL HISTORY MUSEUM
Bulletin

This month's cover is an oblique aerial view overlooking Queen Alexandra Range, Antarctica. Part of Beardmore Glacier is shown. This official U. S. Navy photograph was taken by photo-mapping planes at an altitude of 20,000 feet. (Photograph courtesy of Richard Lewis.)

GLACIERS

AT THIS TIME of year it seems appropriate to turn our thoughts to snow and ice, and to glaciers and ice sheets. Mountain glaciers such as those in the Alps or on Mount Rainier, Washington, have long been known and studied, while our knowledge of the vast ice expanses of Greenland and Antarctica has been greatly increased during the last dozen or so years. The International Geophysical Year, 1957-58, provided a special impetus to the exploration and scientific study of Antarctica.

It is now known that glaciers and ice sheets cover between $5\frac{3}{4}$ and 6 million square miles, or about one-tenth of the total land surface of the world. Antarctica accounts for by far the largest proportion—nearly $4\frac{1}{2}$ million square miles, not including more than $\frac{3}{4}$ million square miles of shelf ice which, although an extension of the ice sheet, is actually floating on the sea. Greenland is very largely buried beneath more than 600,-

000 square miles of ice. The remainder of the world's glaciers is comprised of very much smaller areas such as those of Baffin and Ellesmere Islands, Alaska, Spitsbergen, Iceland, and the mountain glaciers of Asia, New Zealand, South America, Norway, and the Alps. Where the mountains are sufficiently lofty, glaciers are even found near the equator such as on Mount Kilimanjaro in Tanganyika, and on Cotopaxi in Ecuador.

Within recent years it has been possible to estimate the thickness of the Antarctic and Greenland ice by seismic methods and by measuring the force of gravity. In the former method an explosive charge is set off in the ice below the surface. The time taken for the waves produced by the explosion to reach the rock floor beneath the ice and to be reflected to the surface is a measure of the thickness of the ice at that point. The second method utilizes the fact that the force of gravity at any point depends

on a number of factors including the density of the material lying beneath the surface. Different thicknesses of ice will, accordingly, produce variations in the force of gravity which can be measured by very sensitive instruments. Results indicate that the Antarctic ice has an average thickness of more than $1\frac{1}{4}$ miles and that over much of the central areas of both Greenland and Antarctica the ice is almost 2 miles thick.

The weight of this colossal volume of ice has depressed the land of Antarctica perhaps as much as 3000 feet under the thicker ice so that large areas of the rock floor are beneath sea level. If all the ice were to melt, the land would slowly rise to compensate for the reduced load and Antarctica would truly be seen as a vast continent with towering mountain ranges whose peaks rise more than 16,000 feet above sea level. The western portion, probably, would become an island archipelago.

At the same time, the return of all the water now locked in the ice sheets would naturally raise the level of the oceans. It is difficult to say by exactly how much because the ocean floor would presum-

ably sag under the extra weight, but it might amount to about 150 feet. This would be catastrophic for many coastal cities throughout the world.

Glaciers are, of course, active features of the landscape. Snow fall nourishes their surface, which gradually changes downward, by thawing and freezing and compaction, into a denser but still porous mass of spheroidal ice particles called firn, or névé, and then into ice of increasing density. In the initial development of a glacier the continued accumulation of ice eventually leads to instability. The ice tends to deform plastically and to move out under the influence of its own weight, much as a mound of pitch does on a warm day. This plastic flow, which is a complex phenomenon not yet completely understood, will start in a relatively thin mass of ice of the order of about 150 feet in thickness. Increasing thicknesses of ice lead to greater movement and spread of the ice. This movement is naturally aided by gravity. Ice accumulating around the peaks of a mountainous area flows down into the valleys, which become filled with glaciers. However, movement accomplished by the sliding of the whole mass on its bed, is much less than that caused by the plastic flow of the ice itself.

Glaciers continually lose some of their bulk by evaporation, melting—particularly at their extremities—and by calving—that is, the breaking off of large masses into the sea to form icebergs. But as long as nourishment from snow exceeds wastage the glacier continues to expand. Expansion continues until wastage of the enlarged sheet or glacier equals additions to the surface, at which point equilibrium is reached; but although the glacier front is now stationary the ice is still flowing within the glacier. If the rate of nourishment diminishes or if the temperature increases to cause greater melting, the glacier diminishes in size and its margin retreats. The two-mile thickness of the Greenland and Antarctic ice may represent the greatest thickness obtainable in an ice sheet because at that thickness outward flow appears to balance accumulation.

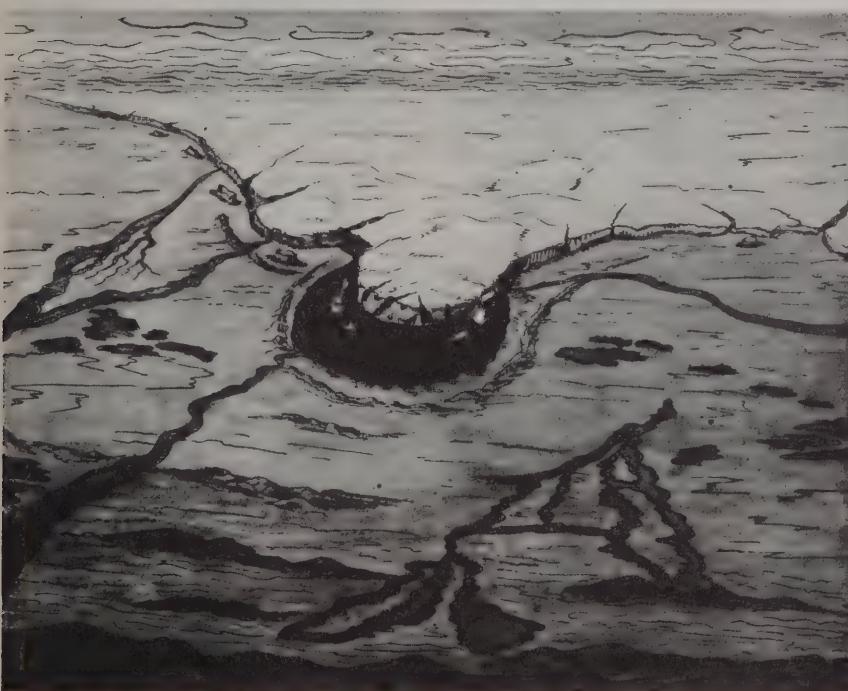
The rate of movement of a glacier is controlled by many factors such as temperature, amount of melt-water, slope, nature of the floor, and thickness of the ice. In the Alps movements of about a foot a day are common. The coastal glaciers of Greenland which issue into the sea have unusually high velocities of up to 100 feet a day, but the main mass

of the ice sheet, and also that of Antarctica, moves very slowly—perhaps an inch or so a day.

Advances and retreats of glaciers have been noted in many areas in recent historical times and they have been closely studied in Switzerland where they were readily accessible to centers of learning. Here the retreats revealed clear evidence of glacial action, such as striations on rock surfaces and mounds of debris left by the melting of the ice. During the latter part of the 18th century and the early part of the 19th century the loose superficial detritus which mantled much of the ground of northern Europe was believed to have been deposited by a catastrophic flood equated with the Biblical deluge. As this idea became untenable, a new concept replaced it which advocated the distribution of deposits by drift ice floating on a sea which had once submerged much of the lands. This theory, supported and elaborated by Sir Charles Lyell about 1835, was widely adopted. However, a number of scientists were already proposing the glacial theory for the origin of the deposits and suggesting, from the evidence studied in Switzerland, that there had been a great extension of the glaciers in former times. K. F. Schimper first used the name "Ice Age" in 1837. It was Louis Agassiz, the famed Swiss naturalist, however, who was responsible for the wide acceptance of the idea of the Great Ice Age, expounding it in Switzerland in 1837. Three years later, in London, he provided evidence for the conclusion that much of Britain had been covered by glaciers, and in 1846 he performed the same feat for the northeastern United States.

Today the concept of the Ice Age is completely accepted as fact and a tremendous amount of data is available on its extent, advances, and retreats. The onset of glaciation was presumably gradual and is believed to have been effected less than a million years ago, at the beginning of the Pleistocene epoch. The ice sheets spread over large areas in the Northern Hemisphere (see map) and the areas of mountain glaciation were extended, reaching to much lower altitudes in the Alps, Himalayas, and even

Schematic perspective sketch of the Chicago region about 8,000 B.C. showing glaciation. The view is northward over the ancestor of Lake Michigan. Drawing by Tibor Perenyi, Geology staff artist.



in the tropics. The Antarctic ice sheet was undoubtedly larger, submerging even more of the present marginal mountain peaks and spreading out even further into what is now ocean. At the maximum extent it is estimated that as much as one-third of the world's land was under ice. The ice sheet in North America alone probably amounted to nearly 5 million square miles and was 10,000 feet thick in its central region, around Hudson Bay. The withdrawal of water from the oceans lowered sea level possibly as much as 350 to 400 feet below present levels.

Study of the deposits left behind by the ice sheets in North America and

in fossil shells to estimate the surface water temperatures at the time they lived. Also, the sediments containing the shells may be dated by determining certain ratios of radio-active elements. In this way changes of temperature equated with glaciations and deglaciations have been proved and dated. Thus the last major glaciation is thought to have started about 65,000 years ago and to have more or less ended about 10,000 years ago when the sea warmed up, although at that time ice sheets still extended as far south as the Great Lakes.

The vanished glaciers have left behind them many signs of their former presence. The grinding moving mass of ice strongly eroded the ground beneath and modified valleys, gouged out basins which now form lakes—our Great Lakes owe their origin in large part to the ice sheets—and sculptured mountain ranges in characteristic ways. Towards the margin of the ice and in front of it large quantities of debris were dumped as the ice melted back, forming a cover of till, or drift as it is still known, recalling the old abandoned drift theory of its origin. Large temporary lakes were formed in front of the ice, and the deposits in one such glacial lake—"Lake Agassiz"—now form the fertile plains of North Dakota, Minnesota, Saskatchewan, Manitoba and Ontario. Modification of drainage patterns led to the formation of many waterfalls along water courses established after the ice retreated. A notable example is Niagara Falls. The erosional and depositional effects of the Ice Age were truly profound. They influence our scenery, agriculture, transportation, power supply, and urban settlement.

There is still much dispute about the causes of the Pleistocene glaciations with their world-wide advances and retreats. Apart from the necessity of an adequate amount of precipitation of snow to form the glaciers, many people consider that a general lowering of the average annual temperature by some 9° to 13° F. is required to initiate a glaciation.

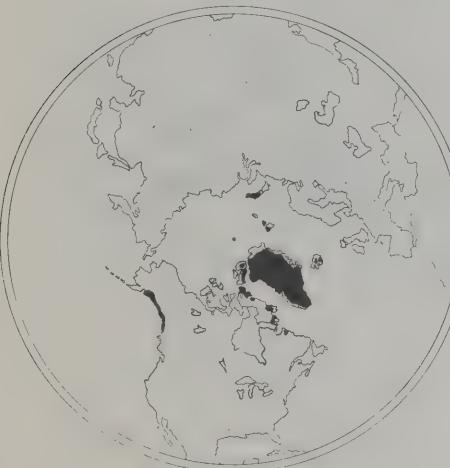
Many theories have been proposed to account for such a lowering. Changes in the atmosphere, such as greatly increased volcanic dust, which would cause greater humidity and cut off some of the sun's heat, have been suggested but are now little entertained. Theories which

not only explain lowering of temperature but would cause periodic increases and decreases have been developed around the known small variations in the earth's motion around the sun. Such periodic changes as would result, however, are generally regarded as being too small in effect to explain the glaciations. Variations in the radiation from the sun have also been invoked. Measurable changes take place related to the 11-year sun spot cycle and elaborate tables have been prepared attempting to correlate these changes with climatic records of historic times and with the glacial advances occurring in the mid-18th and 19th centuries. These attempts are not entirely convincing, however, and the relationships that have been claimed may be illusory or coincidental. G. C. Simpson has produced one well-known theory relating the four glacial periods to two periods of increased solar radiation.

In 1956 M. Ewing of Columbia University and W. L. Donn of Brooklyn College proposed that the glaciations were controlled not by initial changes in temperature but by the interchange of Arctic and Antarctic waters. Flow of warm water into the Arctic ocean would free it of sea ice and cause greater precipitation of snow on the surrounding lands. Development of the ice sheets would themselves cause a deterioration in the weather.

The resulting lower average temperatures throughout the world would cause glacial advances, cooling of the Atlantic, and lowering of ocean levels. Eventually the lowered sea level would inhibit the flow of Atlantic water into the Arctic and the latter would freeze over. Precipitation would decline drastically and the ice sheets would waste away, producing an interglacial period. This trend would be reversed when rising sea level would again permit greater northward flow into the Arctic and the melting of the sea ice.

According to this theory, the Pleistocene glaciation was initiated when the upper layers of the earth slipping over the interior resulted in the present relationships of sea and land relative to the north and south poles. The Antarctic ice developed as a consequence of high



Map of the northern hemisphere. Black areas show existing glaciers; dotted areas the combined maximum extent of the Pleistocene glaciations.

Europe prove that the glaciation was not a single event, but was marked by repeated major advances and retreats of the ice. During the retreats or interglacial periods the ice disappeared from North America and there is floral and faunal evidence that the climate was even warmer than at present. There are generally believed to have been four major glaciations separated by interglacial periods. The latest glacial period had several partial retreats and re-advances and evidences of these oscillations are found in the Great Lakes area.

Confirmation of the alternating glacial and interglacial conditions has also been found in cores of sediments lying at the bottom of the Atlantic Ocean and the Caribbean sea. It is possible by measuring the ratio of oxygen isotopes

land at the pole and was not so subject to the changes affecting the areas surrounding the polar Arctic ocean. Thus the ice sheet there persisted through the interglacial periods as it does today.

That there was a change in the position of the poles in earlier geologic periods is supported by the finding of coal seams and fossils in Antarctic rocks, proving that the glaciers were absent and the climate warm even in times as geologically recent as 50 million years ago. Likewise, deposits proving a wide-

spread glaciation in South America, Africa, India, Australia, and even Antarctica between about 310 and 280 million years ago suggest not only a different pole position but also that these continents may then perhaps have been part of a much larger land mass.

Since the Arctic ice at present shows signs of decreasing, it is interesting to speculate that, if the control of Pleistocene glaciation is something along the lines postulated by Ewing and Donn, we may be heading into a new glacial pe-

Antarctic Names

By Neal Stanford

Have you a hankering to have some spot on earth named after you? Officially, that is?

If so I can tell you of a place on this globe where with a little enterprise, possibly some adventure, and still, again, a not too sizable investment, one's wish for a geographic memorial can still be fulfilled.

Of course it won't be a continent, or even a river, or mountain range that will bear your name, for those have already been labeled or spoken for. You may have to settle for a cape, harbor, small glacier, or possibly just a cove. But you can still be memorialized if you have the proper credentials.

Antarctica is the region I refer to, and I became aware of this when for some still unexplained reason I received through the mail a wall-to-wall, floor-to-ceiling map of Antarctica with thousands of natural features carefully labeled and identified—but still room for a few thousand more names.

I also was presented with a telephone-size directory of approved geographic names in the Antarctic, with an explanation after each, or who or what it was named for, and why. I also have form DG80, put out by the Department of the Interior, in which it appears. I can propose a name for some Antarctic nat-

ural phenomenon, describe my chosen physical feature, and give "supporting data"—which means explain why my proposed name is worth considering.

It is then the duty of the Secretary of the Interior (on recommendation of his "board of geographical names") to either accept my proposal or turn it down.

There may have been a day, a century or so ago, when intrepid navigators in the Antarctic region could spot a coast, or mountain range, or glacier, and name it without going through all these formalities. But those days are over.

The naming of Antarctic natural features is today not only formalized, but regularized and sanitized sufficiently to meet any Better Business Bureau standards. The judges (much like those presiding over the perennial beauty contests that annually sweep America) have their criteria for turning thumbs up or down. They not only have a guidebook on what kind of names would be acceptable—but also, specifically, what kind of names would not be acceptable.

For example, you can no longer suggest a name for some Antarctica spot just because of family ties of deep friendship, that is, and get it accepted. Nor will you get a plateau, sea, ice shelf, or anchorage named after you just because you contributed funds, or equipment, or supplies for an expedition—if you tried to capitalize on that investment "for commercial ends." Nor

period. Of course a new Ice Age would take thousands of years to develop. It may be, however, that a world wide lowering of temperature is required for a new glaciation. In that case, the evidence at present of a global amelioration of climate, as shown by the general retreat of glaciers and warming of the oceans, suggests that we may still be emerging from the last glaciation. Further contraction of the glaciers and rising seas may lie ahead before the onset of a new Ice Age, many thousands of years hence.

if your dog food is what the huskies are eating in Antarctica this year need you try and name a camp site or nunatak after it. No go.

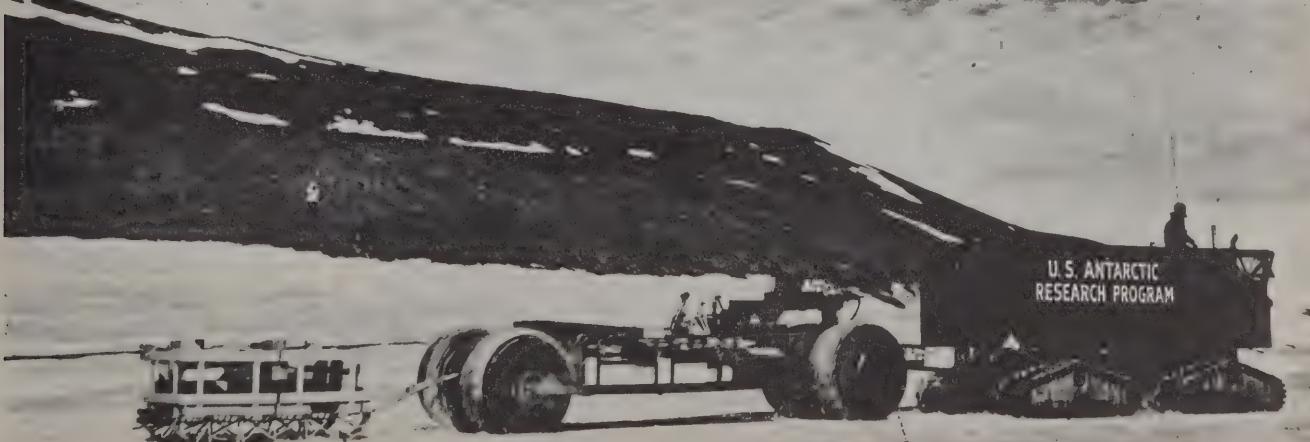
However, if you have led or organized an expedition to the Antarctic, made a discovery there, led a field party, captained a ship, or contributed to the scientific knowledge of Antarctica you have a good chance of being memorialized.

It is even possible just to have been on an expedition and have some bay or rock formation named for you. But if you are in this category you can only count on "third order" feature commemoration. "Third order" features include: hills, cliffs, rocks, points, coves, anchorages.

"First order" features (such as coasts, seas, plateaus, extensive mountain ranges, large glaciers) are reserved for expedition leaders, financial backers of expeditions, etc. "Second order" features (peninsulas, smaller glaciers, gulfs, islands, harbors, prominent mountains) go to the heroes, contributors to Antarctic scientific knowledge.

Of course there are a lot of nonpersonal names given natural features in the Antarctic: Hope Bay, Royal Society Range, Deception Island, Gull Channel, Porpoise Bay, and the like. But with some 3,000 features already named, with possibly only one or two thousand still waiting names, the people—not the penguins—can be expected to get what is left.

The Christian Science Monitor



New Arctic Phenomenon: Ice Cork Plugs Channel

New York Herald Tribune

OTTAWA.

Canadian glaciologists are studying a new Arctic phenomenon. A piece of ice, 60 miles square, has formed a gigantic plug between Greenland and Ellesmere Island, in the High Arctic, near the top of the world. The plug has caused millions of tons of ice to back up between the two land masses and has resulted in an unusual clearing of open water to the south. It was recently discovered by the crew of a Royal Canadian Air Force transport plane flying over the area.

The glaciologists are surprised at the location of the ice island, for it is considered unusual for such a large mass to sail down the narrow channel separating the two land masses. It is lodged crossways in Kennedy Channel, one end hooked over Hans Island, which is acting as an anchor. The phenomenon is far removed from the Arctic shipping lanes, but should the ice island break free and continue its southward course, it could conceivably move into those areas plied by the Arctic supply vessels later this summer.

Dr. Fred Roots, co-ordinator of the polar continental shelf project of the Mines and Technical Surveys department, said the position of the island suggests this was the route taken a few years ago by an abandoned Russian floating laboratory which was located at the east end of Baffin Island.

The ice island was one of many created last year when approximately 200 square miles of ice shelf from the north coast of Ellesmere Island, the most northerly island in the Arctic archipelago, became detached and began floating freely in the Arctic Ocean. RCAF reconnaissance aircraft have been keeping track of the islands by means of radar reflectors dropped on their surfaces last summer.

While most of the islands began floating westward, this particular island, the largest of the group, drifted eastward, and floated undetected past Alert, the joint Canadian-U.S. weather station on Ellesmere.

Two months ago, a patrol plane spotted the island in Robeson Channel, and, a few weeks later it was located further south in Kennedy

Channel, about 200 miles southeast of the island spawning ground.

Ice islands differ from other Arctic Ocean ice floes in their unusual thickness and in their typically smooth ridge and furrow surface pattern. Their bulk and resistance to breakup make them ideal platforms for scientific research.

The ice island phenomenon was first discovered in 1948 by U. S. Air Force reconnaissance aircraft flying out of Alaska. The first, and largest discovered to date, was T-1, a 140-square-mile slab originally located about 300 miles due north of Point Barrow. It, too, is believed to have broken off from the Ellesmere Arctic ice shelf. It is one of about 40 ice islands currently floating around the Arctic Ocean. T-1 is now trapped within the Arctic archipelago, but is still on the move, working its way southwest and may, eventually reach the ocean again.

T-1 was discovered along with T-2 and T-3. The Americans established a floating scientific laboratory on the smaller T-3 in 1952 to study the Arctic Ocean. It was abandoned in 1954, then re-

occupied in 1957 for the International Geophysical Year.

At the present time T-3 has a population of 10 scientists and 15 U. S. Air Force men as it drifts westward from Point Barrow, having completed a circuit of the Arctic Ocean. Three years ago, T-3 moved dangerously close to Soviet waters and the Americans were prepared to abandon the floating laboratory, but the island switched course and retreated into Canadian-U. S. waters.

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Book Written For Eskimo Children

The Christian Science Monitor

New York

A 23-year-old Eskimo girl from Baffin Island has written what is said to be the first fiction book in the Eskimo idiom for Eskimo children. It is being published this month.

The book will be distributed to Eskimo children throughout the north by the Canadian Government.

It represents an effort to introduce a new orthography which, it is hoped, will make possible the emergence of one of the native dialects as the standard literary Eskimo language.

Written by Leah Illauq, the story tells about a polar bear which hatches the egg of a flighty arctic tern. When the shell cracks open out comes a small polar bear with wings. The book is illustrated with pen and ink sketches by the author.

"The imaginative little story is the first of many that we hope will be written by Eskimos for their own enjoyment," Walter Dinsdale, Minister of the Department of Northern Affairs and National Resources, was quoted as saying.

The new orthographic system puts key Eskimo sounds into Roman letters and thus does away with the Eskimo syllabic typewriter and letter presses, a government statement explained.

Miss Illauq, who is "mostly self-educated" and has served as teacher in Resolute on Cornwallis Island, said she studied the new system for only about a month before she could use it.

The title of the book, "Imi-routailakuluk Nanualullu," The "Little Arctic Tern and the Big Polar Bear."

Well, it's easy to learn for Eskimos, anyhow.



Arrow indicates site of large floe blocking Arctic ice.

Oil Hunt Pierces Arctic

By George A. Yackulic
The Christian Science Monitor

Red Deer, Alta.

Canada's high arctic regions are receiving increasing attention in the mounting search for petroleum, and at least two more deep test wells will be drilled in the area north of the North Magnetic Pole during the coming months in the hunt for new oil reserves.

A million-dollar drilling program calling for a pair of wells backed largely by British interests has been announced for Cornwallis Island by an Alberta-based company, and a Toronto group has two wells under active consideration for Bathurst Island this year.

Petroleum exploration of Canada's high arctic already has seen a drilling rig from Alberta put one wildcat well down to a depth of 12,543 feet at Winter Harbor on Melville Island. While that test hole did not yield commercial production, it did disclose significant evidence that large volumes of crude oil and natural gas might be found in that remote and frozen northland.

Most of numerous firms interested in petroleum exploration in Canada's arctic islands contemplate the United Kingdom and northern Europe as logical markets for their anticipated discoveries of crude oil. However, transportation of oil from those regions would certainly pose many enormous and unique problems.

Drilling of the two wells definitely projected for Cornwallis Island is to be started during the latter part of this year for Round Valley Oil Company, Ltd., of Calgary, Alberta, and its affiliated firms. Present plans call for sinking each of the wells to a depth of 7,000 feet.

The first drilling site will be on the south shore of Cornwallis Island and four miles from Resolute Bay settlement. The second test venture will be put down 34 miles farther north, near the center of the island.

Burmah Oil Company, parent of Round Valley and Associated Libitos Oilfields, Ltd., has brought C. T. Bowring & Co., Ltd., of London into this exploration play.

This is Bowring's first step into oil hunting in Canada, although it has oil interests in other parts of the world. The company is mainly a shipping and insurance brokerage firm but has other very diversified interests.

Also teaming up with Round Valley for the two wells, by

Indians, Eskimos Study Together

By Lyn Harrington
The Christian Science Monitor

Toronto

Yellowknife in Canada's Northwest Territories has been famous for decades as a gold-mining town. Chances are it will become more noted in the future for its unique high school, in which academic and vocational courses are offered to Eskimo, Indian, Metis, and white pupils. It has proved so successful that a second such school is now under construction at Frobisher Bay, Baffin Island, in the Eastern Arctic.

The school, which opened in 1958, is one of the most hopeful aspects of northern development. It has shown that young people of various racial backgrounds can live together without hostility, and take their place in the outside world. Whether from igloo, tepee, shack, or split-level, the students find they have the same interests in sports, friends, social life, and careers.

This is no instance of the white man graciously permitting other races into his society. It's a true equality within the school and residence, and increasingly in the town and the Territory beyond. Education is breaking down old barriers of racial discrimination.

Students at the Sir John Franklin School come from across the Northwest Territories, from Aklavik to Hudson Bay, from Fort Smith to the Arctic Ocean. They are chosen for intelligence and aptitude,

providing a quarter of the needed capital, is the Bank Eno Mines, Ltd.-Phoenix Canada Oil, Ltd., partnership.

Drilling plans involve the shipping of drilling equipment from Alberta to Cornwallis this summer.

While the drilling rig that was used in the pioneer arctic well on Melville Island is only 300 miles from the two projected well sites, the limited open-water season in the region necessitates the movement of other equipment thousands of miles from Alberta through Montreal and via the water route to Cornwallis.

The delivery schedule for the drilling equipment is being coordinated to take maximum advantage of all facilities in the Resolute Bay area, where it will be landed.

Meanwhile, the Toronto group headed by Dominion Explorers, Ltd., is advancing plans to launch its exploratory drilling program on Bathurst Island this year.

All of the arctic ventures are being watched by the world's petroleum industry

since the school has limited accommodation.

Akaitcho Hall, the residence recently enlarged to house 200 students, is named for a notable Copper Indian chief who aided the explorer, Sir John Franklin, in 1820. Its murals honor both Eskimos and Indians, its dormitories house girls and boys who move easily with a similar mixture of 90 day students.

Some students arrive unable to speak English, but they pick it up readily, for all students are urged to mix with others and with townfolk, not to segregate themselves in racial groups. Some have never attended school, while others have worked for years. They range from 14 to 25 years, and one of 63 is taking janitorial instruction. The staff is decidedly practical.

This senior high school comprises academic, shop, and commercial courses; and a vocational school in which the pupils spend equal time in classes and in shopwork. In

addition there are "opportunity" classes. Last year one older student started school at Grade 3 level in mathematics, and through such classes, he passed Grade 8 examinations in June.

The academic curriculum follows the Alberta Course of Studies, and graduates receive their certificates from the Alberta Department of Education. In social sciences, more emphasis is placed on the history and natural sciences of the Northwest Territories. English assignments may turn up a Kuchin Indian legend as readily as a description of Great Slave Lake in a storm. Art classes awaken interest in the northern scene, and mine headframes appear often in landscapes. Music instruction includes Eskimo chants as well as Sousa marches.

Increasingly the students have become aware that they need a skill to find employment, and they need academic knowledge to understand the intricacies of the modern world of work and social life.

Many students find technical skills the easiest to learn, and have become proficient carpenters, mechanics, miners and heavy equipment operators. Both boys and girls get on-the-job training, the boys on construction projects (such as the new museum in Yellowknife), the girls as waitresses, hairdressers, clerks.

They not only learn a skill, but learn to adapt socially and break into urban life generally. These students are eagerly sought by employers, for job opportunities are increasing in the Northwest Territories.

School life isn't all classroom instruction. A vigorous recreation program includes hockey and basketball leagues, curling and badminton tournaments.

Unquestionably, the Sir John Franklin School provides a first-rate pattern for the future.

Modern Eskimo Likes Ice Cream, Deep Freezers

GENEVA, Jan. 1 (Reuters) — Arctic living has jumped from the Stone Age to the nuclear age in one generation and today's Eskimo has a taste for such civilized delights as ice cream.

This picture of modern Polar life was sketched by experts at the World Health Organization's First International Conference on Medicine and Public Health in the Arctic and Antarctic held here.

Although there still are some Eskimos who live in igloos, dress in polar bear skin trousers and shade their eyes with slit-bone visors, most are rapidly adapting themselves to mid-twentieth century life.

Housing developments are taking the place of igloos, though sanitation is still lacking. In one area of Alaska, 76 per cent of the Eskimos have radios and others are the proud possessors of deep freezers.

They have even been afflicted with the modern desire to keep up with the Joneses. Experts reported one Canadian Eskimo family painted a television screen on the front of their radio. Experts also told of Norwegian Eskimos who dash into trading posts on dog sleds to buy soft drinks and ice cream.

Stone-Age Man in Siberia Built Large Barbecue Pits

MADISON, Wis. (Science Service) — Stone Age man in Siberia used barbecue pits.

Excavations of settlements along the Angara River have disclosed a number of large deep pits. Until recently, the pits puzzled Soviet archeologists who could not figure out why they had limestone fireplaces.

The archeologists realized recently that the pits were actually barbecues used for cooking whole animals or parts of animals. The pits could also be used for smoking, drying and other domestic purposes.

Prof. V. E. Larichev of the Institute of Archeology, Leningrad, reported on the findings in Arctic Anthropology.

Canadian Eskimos Form Cooperatives To Aid Development

FROBISHER BAY, N. W. T. (Canadian Press)—Eskimos in the Canadian Arctic are emerging from the depths of poverty with the aid of cooperatives.

Cape Dorset, on the southwest tip of Baffin Island, is an example.

Until 1959 Eskimos hunted and fished independently, with mere survival as the ultimate goal. They could not afford to maintain ammunition supplies and their kayaks were rotting.

James Houston, a Northern Affairs Department administrative officer, went to the community and got the Eskimos together in a cooperative venture. He found a few good stone carvers, who then took on the job of teaching others.

This year Oshaweetuk, a Cape Dorset Eskimo, came to Frobisher Bay to the first conference of Arctic co-ops, armed with the latest financial statement. It showed that the Cape Dorset co-op retail store now has three departments and that more than \$47,000 was paid out in local wages to the 61 members.

Peter Kamongoak came from Resolute Bay with a similar story. The co-op there was organized two years ago to handle retailing, fur marketing and handicrafts. In the first year its net earnings totaled \$2,103. Last year it topped \$52,000.

These are the most successful of the 16 Eskimo co-ops now operating in the Canadian Arctic but all are making a major contribution to the economic development for this bleak territory. Now one in five of the 11,800 Eskimos belongs to a co-op, and more are in the process of being established.

Pentagon Blames Mishaps For Cuts in Cable to Thule

WASHINGTON, May 9 (AP)

The Pentagon reported today that there had been numerous instances of cuts and breaks in the ocean-bottom communications cable to Thule, Greenland, site of a ballistic missile warning station.

It said that none appeared to have been deliberately made.

Six instances since the fall of 1961 were listed by the Defense Department in reply to questions by reporters. The most recent occurred between April 2 and 9.

A spokesman listed the causes as storms, icebergs and trawlers using net devices that scrape the bottom.



SURVIVE ORDEAL — Joanis Kudluka, 17 (left), poses with three other Eskimos whom he helped to safety after crash of plane near Ungava Bay, Quebec, Canada.

Kudluka guided the plane's pilot through 15 miles of stormy wasteland in minus 46 degrees, to get help.

(UPI TELEPHOTO)

SURVIVAL METHODS TAUGHT BY ESKIMOS

EDMONTON, Alberta (Canadian Press)—Three Eskimos teach snow-block cutting, Arctic shelter, igloo construction and techniques of living in desolate northern regions to 250 defence department employees and Royal Canadian Air Force men who take an eight-day course each year.

"Eskimos have a different attitude from us toward survival," said Flight Lieut. Dick Connick, the school's chief instructor.

"A few years ago an Eskimo left a northern camp with only his dog team. He didn't take his sleeping bag, something Eskimos usually carry with them. A blizzard blew up and the Eskimo was left without shelter. In a similar situation a white man would probably keep his dogs going until they dropped, and finally be frozen to death.

"But this Eskimo just gathered his dogs in a tight circle around him and slept until the storm was over.

The Arctic survival course begins with a day of lectures. Students are taught to make fires, igloos, Arctic tents, how to wear clothing for maximum warmth, and how to prevent and care for frostbite.

Walrus Rams Soviet Boat

LONDON (Reuters)—A walrus rammed a fishing boat from Vladivostok and nearly sank it, the Soviet press agency Tass reported recently. Before attacking, the walrus threw off a calf it was carrying on its back and then picked up the calf again. The boat was holed and the walrus lost a tusk.

8 Found Safe in Arctic Area After 2 Weeks on Lost Plane

Halifax, Nova Scotia, Jan. 28 (UPI)—Eight persons, including three children, aboard a plane missing for two weeks near the Arctic Circle have been found safe, officials reported.

The single-engine, ski-equipped Norseman plane last was heard from Jan. 13 when it left on a routine 140-mile flight from Payne Bay in northern Quebec to Ft. Chimo.

The plane, piloted by Paul Garon, 25, of Quebec City, was feared to have crashed somewhere near the Arctic Circle and little hope was held for the survival of its occupants. They included A. F. Flucke, of the Federal Department of Northern Affairs, three Eskimo women and three Eskimo children, aged ten to 16.

A search was made by planes of the Royal Canadian Air

Force, the U. S. Air Force and civilian aircraft.

Garon and the 16-year-old Eskimo boy walked from the wilderness to Ft. Chimo for help, an official at search headquarters here reported.

The plane and the other survivors were located yesterday by another Norseman plane about 60 miles southwest of the plane's destination, just south of the Arctic Circle.

Another ski-equipped Norseman was scheduled to take off shortly to pick up the six remaining passengers.

How the eight people managed to survive in the sub-zero cold of the wilderness was not determined immediately, but a spokesman said the plane carried emergency supplies including a stove, blankets and a tent.

Light Planes Cross North Pole

WASHINGTON, June 6 (UPI)—Two Cessna 180 single-engine airplanes flew to the North Pole and landed on May 24 in the "deepest known penetration of the Arctic Ocean basin" yet made by light aircraft, the Navy announced today. The pilots of the planes were Robert Fischer and Cliff Alderfer, civilians attached to the Navy's Arctic Research Laboratory at Barrow, Alaska.

Ship 'Arctic Sealer' Is Reported Sunk

HALIFAX, N. S., April 15 (AP)—The 749-ton Nova Scotia sealing ship Arctic Sealer was reported to have sunk today off Canada Bay at the northern tip of Newfoundland.

Reports reaching Halifax said the 70 crew members were rescued by a sister ship, the Arctic Endeavor.

British Columbia Looks to North, But Finds Yukon Cool to Settlers

The New York Times

VANCOUVER, B. C.—When Prime Minister John Diefenbaker unveiled his "vision of the North," few areas expressed more interest in the ideal than British Columbia.

Trade and cultural interests, it is said, run south and north rather than east and west for those living on the Pacific side of the Rocky Mountains. There is plenty of interchange between British Columbia and the south, for residents vacation in California and shop in Seattle. But what do they know of the north?

Seven of ten Canadians live within 100 miles of the United States border. In British Columbia, the cities of Vancouver and Victoria account for half the population of 1,750,000. The rest live in a vast area traversed by one good highway and one railroad reaching up to the Yukon border.

Fort St. John is typical. It is a city of 6,000, but 1,000 are transient workers who live in trailers. Recently the community had to build a \$125,000 school for 93 children, but only six of the families were taxpayers. It was one of the tribulations of progress—oil development and construction of the Peace River Dam.

Some British Columbians seeking more real estate have considered the Yukon Territory 1,000 miles to the north of the United States border. The idea has been broached that one day the Yukon might be joined to this province, because it is not likely that Yukon will gain provincial status otherwise for at least 25 more years.

In the territory's 207,000

Norwegian Scientists Plan Arctic Archipelago Survey

The Norwegian Polar Institute is planning to send 15 research groups to Spitsbergen this summer to make scientific observations in various parts of that Arctic Ocean archipelago, according to *News of Norway*, an official publication.

The approximately 50 explorers will have two vessels and one helicopter at their disposal.

Besides large-scale topographic mapping of coal deposits, the scientists will try out the new Hi-Fix electronic surveying system. The system will be used to take soundings of waters between Bear Island and Spitsbergen as far north as the sea ice permits.

The expedition vessels will be used for deep-sea hydrographic surveys. The helicopter will give geologists and topographers greater mobility.

square miles, there are only 14,600 persons, more than half in the area of Whitehorse, the biggest city. It may be the fastest-growing area in Canada in terms of population. In 1931 there were only 4,000 persons, after the peak of 24,000 in the gold rush days of 1901.

But it is still adventurers' country, despite the airplane that can bring a man and his family "outside" to escape the cruel winter.

This year has been the most active for exploration, with finds of gas and iron ore, and there is still a good chance for the young man willing to work. "We are looking for people" says Yukon Commissioner Gordon Cameron, who administers a territorial budget of only \$9,800,000 for his enormous territory, "but they should not be people with stars in their eyes."

British Columbia is looking northward. But it is looking realistically, and there is a vast amount of real estate that contains neither oil nor land fed by dams.

1962 Whale Catch A White Elephant; Industry May Die

The New York Times

VANCOUVER — It's about time for the whaling boats to put out to sea again, but whether they venture into the rough North Pacific is still in doubt. Last year, after a two-year hiatus, whaling out of Coal Harbor, on Vancouver Island, was resumed. The season was an artistic success, with 713 whales taken, but a commercial failure, with most of the meat going for mink food.

In the 1960 and 1961 seasons there was no whaling out of British Columbia. High labor costs and low prices for oil made it impossible to operate. In 1962, however, a Japanese company proposed that it be reopened, with the sale of whalemeat in Japan depended upon to bring total yield to a profitable sum.

The Japanese company, Taiyo Gyogyo, contributed two 120-foot diesel hunting vessels. British Columbia Packers contributed its whaling station and \$500,000 was raised to finance the season. A processing plant was equipped to freeze 100,000 pounds of meat a day, and hold 1,000 tons in cold storage.

Two Japanese and four Canadian ships made up the fleet. The herds were slow in coming

Oil Quest Spotlights Spitsbergen

By George Embree
The Christian Science Monitor

Copenhagen

Recent reports published here indicate that next summer will witness increased activity by American, Norwegian, and Soviet geologists who have been searching for several years for oil deposits in the Spitsbergen archipelago 550 miles north of the northernmost part of Norway.

The Scandinavian Times reports that about 100 Soviet natural scientists are expected in the area next summer.

Although no oil discoveries have thus far been reported, the repeated visits by geological survey teams from the three countries to the four major islands in the archipelago seem to indicate that initial test drillings have not been discouraging.

The archipelago has a total area of about 24,300 square miles but a population of only 3,500. It is known to be very rich in coal deposits.

Whaling first attracted the British, the Dutch, and the Norwegians to this part of the Arctic during the 17th century, but when this industry gradually died out these countries lost interest in the islands and let their claims lapse until the early 1900's when the coal deposits were discovered.

Norwegian sovereignty over the area was finally recognized by the 1920 Treaty of Paris and became effective five years later. Economic exploitation was open to all its signatories, but only Norway and the Soviet Union conducted mining operations there after 1930 (Czarist Russia had opened coal mines in 1912.)

up from the south, because of the late spring, but by the middle of August 600 whales had been killed. One of these was a blue whale 82 feet long, the second - largest ever taken in British Columbia waters.

Then came the Japanese Government's austerity program. The allocation of foreign currency to buy whale meat for human consumption was cut off. The entire catch from the 713 whales in storage when the season ended in September had to be exported to the United States to mink ranches, at prices far below those that had been expected.

Oil prices also disappointed the whalers, sinking to levels unseen since the Depression.

In 1941 most of these installations were either dismantled or destroyed by British, Canadian, and Norwegian troops to prevent their use by the Germans.

In 1958 coal production in Spitsbergen mines was more than 600,000 tons. Approximately 1,900 men worked in the three Soviet fields and another 1,300 in two of the three Norwegian mines.

Despite high wages there is still a large turnover in the labor force because the islands are icebound most of the year and there is no daylight between October and February. Discovery of reasonably profitable oil deposits would further increase the archipelago's value as a source of fuel.

Last summer two Norwegian geological survey expeditions sought to expand their country's efforts in the race with an American company and Soviet scientists to stake claims in what is hoped will be oil-bearing regions.

Norsk-Polar Navigasjon A/S, which has been conducting surveys there since 1958 at Isfjorden near Bellsund and two smaller areas near Forlandsund, was attempting to raise a total of \$143,000 to expand its operations.

It had planned several years ago to build an airport on one of the major islands. However, this immediately brought protests from the Soviet Union which charged that it was merely a cover for the extension of NATO's system of airfields in northern Norway.

Consequently the plan was dropped.

Vast crops of soybean oil, peanut oil and sunflower-seed oil depressed the market for food purposes, and Peru sent north a record pressing of fish oil.

Now the Japanese have promised that whale meat will be admitted and money for its purchase provided. But oil prices are still so low the Canadian whaling company is doubtful about taking a chance.

Geologist Gets Prize

Dr. James L. Dyson, head of the geology department at Lafayette College, Easton, has received the 1962 Phi Beta Kappa science prize of \$1,000 for his book, "The World of Ice," published last year.

Giant Bog Blocking Efforts to Develop The Canadian North

OTTAWA, (Reuters)—Canadian scientists are seeking to conquer the gigantic bog blocking settlement in the uninhabited north.

Eight scientists and engineers are at work on the problem at McMaster University, Hamilton, Ont. They hope their findings will prod the government into systematic development of the north.

A forbidding, spongy sea, known as muskeg bars the direct routes to northern settlement.

It is made of many layers of rotting, wet vegetation on a base of peat. Canada's muskeg, a name taken from an Indian word meaning, approximately, "grassy bog," covers about 500,000 square miles.

For 15 years, Dr. Norman Radforth, Professor of Biology at McMaster, has been studying muskeg.

With some Government assistance and by aerial photography, he has compiled the first complete map of the Canadian muskeg, identifying five main topographical patterns.

With the help of experts in other fields of science and engineering, he is now working on plans to make the muskeg usable for agriculture, forestry, oil and mineral exploration.

The first objective is to design a vehicle capable of traveling across the swampy terrain.

Various prototype vehicles have been impressive enough to be impressive enough to attract commercial development.

Prof. Radforth believes the muskeg country would be ideal for grazing cattle, if it could be properly developed, as well as for forestry and farming.

Annual Iceberg Crop

7,500 Off Greenland

On the average, some 7,500 new icebergs are formed each year from glaciers on the western coast of Greenland. About one in 20 makes the 1,200- to 2,500-mile journey to the Grand Bank, south of Newfoundland, and thence into the North Atlantic shipping lanes.

Most of the bergs waste away in northern waters, but a few hardy stray ones have been sighted as far south as the Azores and Gibraltar, and in the warm waters off Bermuda.

1,100 Flee Canadian Floods

HAY RIVER, Northwest Territories, May 3 (AP)—Four hundred of Hay River's 1,600 residents and all 750 residents of Fort Simpson have been evacuated by air to escape flood waters from the Hay, MacKenzie and Laird Rivers.



By Russell H. Lenz, Chief Cartographer

New Agricultural Land in Canada's North

Canada Finds Vast Arable Tract

By George A. Yackulic

The Christian Science Monitor

Red Deer, Alberta

Another million acres of arable land has been discovered in Canada's far northland — in a virgin wilderness region where local production of foodstuffs is becoming increasingly precious with the development of a huge lead-zinc mining complex.

This potential farming land, expected to be in production within 10 years, is contained in a 200-mile stretch of the Liard River Valley between Fort Liard and Fort Simpson in the Northwest Territories.

It was discovered during a recent soil survey by J. H. Day of the Canadian Department of Agriculture Soil Research Institute in Ottawa. The discovery, fabulous because of its geographical location and great promise, gives visionaries new evidence of the economic potential of Canada's remote northwest.

The survey which found the rich, brown farming soil beneath a forest cover of poplar and spruce was part of a Canadian Government plan to map all districts in the Yukon Territory and in the Northwest Territories having agricultural possibilities.

Earlier, approximately 220,000 acres of arable land had been uncovered in the same vicinity, but westward, in the Takhini and Dezadeash valleys of the Yukon, through which the Alaska Highway runs.

According to Frank S. Nowo-

sad, the expert on northern agriculture for the Canadian government, a discovery of 1,000,000 acres of arable land in one district in this era is "most surprising."

Previously, the amount of arable land in the entire Mackenzie River basin had been estimated at no more than 1,000,000 acres.

From Fort Liard in the southwest corner of the District of Mackenzie, the Liard River Valley with the newly discovered farmland runs northwards to Nahanni Butte, then north-easterly to Fort Simpson at the junction of the Liard and Mackenzie Rivers.

To the east, on the south shore of Great Slave Lake, development is just starting on vast deposits of lead-zinc ores at Pine Point, where a large town is expected to grow rapidly within a few years.

A 435-mile railway now is being built towards Pine Point from northern Alberta at a cost of \$86,000,000 to haul out lead-zinc concentrates and help to develop the wilderness region.

The bulk of the best land in the new discovery is in the Fort Liard-Nahanni Butte section, where the sweeping "S" curves of the Liard River provide better drainage. For the rest of the route, the river follows a comparatively straight course through poorly drained land.

The surveyed portion of the Liard valley ranges in depth from two to 15 miles on each

side of the river and contains 1,753,000 acres.

Mr. Day rates 359,000 acres as good arable land, 263,000 as fair, and 319,000 as poor. The remaining 812,000 acres of land is rated as nonarable.

The better arable land was found largely on the well-drained alluvial terraces within one to three miles from the river.

The land is best suited for livestock farming, in the opinion of Mr. Nowosad, and thus would provide much-needed meat for the large numbers of mining, lumbering, and other workers who will be engaged in that part of the northland in the near future.

Brome, timothy, and other cultivated grasses would thrive and provide hay and pasture, while some of the poor and nonarable areas could serve as rough pasture for livestock.

In addition, early oats and barley would provide concentrated feed for winter rations and permit dairying operations to provide more foodstuffs that now must be flown into the region at great cost.

Mr. Nowosad also is convinced that the new area could produce the same kind of farm and garden crops as those already grown at the Canadian Government's experimental farm at Fort Simpson.

Good crops of many of the harder kinds of vegetables can be grown there without protection against frost. And with the use of plastic covers, such tender vegetables as sweet corn, tomatoes, cucumbers, and peppers can be produced with satisfactory quality.

At the Fort Simpson experimental farm, too, strawberries and raspberries ripen satisfactorily most years.

ESKIMO UP ON ANGLES

Systems of Writing Include Variety of Symbols

Several systems of writing the Eskimo language are now in use in Canada, according to the article in Arctic, journal of the Arctic Institute of North America.

The syllabic system, consisting of small triangles, right angles, acute angles, semicircles, etc., has been adopted by the great majority of the Eskimo people.

Several alphabetic systems based on roman letters are also used.

Alaska Flood Airlift

ANCHORAGE, Alaska, May 22 (AP)—Air Force and Army helicopters have plucked scores of residents from flooded villages along the ice-clogged Kuskokwin and Yukon in western Alaska. Many more awaited rescue.

Pair Lost 7 Weeks In Yukon Rescued; Plane Struck Peak

WATSON LAKE, Yukon Territory, March 25 (AP) — Starving and injured, an American pilot and a Brooklyn model were rescued today after surviving for seven weeks beside their crashed plane in the cold of the Canadian north.

Helen Klaben, 21 years old, of Brooklyn, was thin from hunger. She had gangrene in a fractured right foot and her broken left arm was in a splint.

Her pilot, Ralph Flores of San Bruno, Calif., had broken ribs.

They said that there were only two cans of fruit and two cans of sardines when their plane crashed on a 4,000-foot mountain Feb. 4 on a flight from Whitehorse en route to the United States.

They reported that they made this food last for seven days and from then on they had nothing. They survived by making a campfire and melting snow for drinking water.

The rescue pilot, Jack McCallum, said Miss Klaben was in good spirits but "cried in my arms when we reached her."

Mr. McCallum piloted one of three private planes that had flown out to look for them after the wreckage of their plane was spotted Sunday by a Canadian pilot.

The temperature had dropped to 40 degrees below zero during the ordeal and the snow was deep.

Mr. Flores and his passenger had moved down the mountain side near the Yukon-British Columbia border and set up a tarpaulin for shelter. Wood for fire was chopped with a hammer and a chisel.

Reports from the scene indicated it took Mr. Flores three days to tramp out an SOS in snow near the crash.

WHITEHORSE, Yukon Territory, March 26 (AP) — Ralph Flores, pilot, and his passenger, Helen Klaben, bounced back today from the effects of their seven-week ordeal in subzero Canadian wilds. A physician said they could leave for home as soon as they wished.

Doctors said that the restriction of activities, because of injuries, and the fact they were well supplied with clothing helped the two to survive, but they doubted that either could have lived another week.

The plane crash came when Mr. Flores was flying to Seattle with Miss Klaben as a passenger from Fairbanks, Alaska. He had completed a contract as an electrician on a United States DEW line (distant early



Ralph Flores



Helen Klaben

Ordeal of Two Amazing To All Survival Experts

The American Medical Association explained these amazing survivals this way:

After the food intake is cut off, the body starts working on its stored fat. When the fat is burned up, the body goes to work on the protein of its tissue.

Also, cold weather reduces body metabolism, the rate at which food is converted into energy. Thus it doesn't use up its nutritional resources as rapidly as it would in warm surroundings.

Starvation also reduces the metabolic rate because people without nourishment become weaker and can't move around so much.

The AMA references say women should be able to withstand both cold and starvation better than men because their bodies normally store more fat.

warning) radar network, and she had finished five months of work as a draftsman with the United States Bureau of Land Management.

Mr. Flores said the weather was foggy and snow was falling when he ran into trouble. He was blinded by the clouds and lost contact with the radio navigation range. Flying at 7,000 feet, he dropped to 3,000 feet in an effort to get his bearings.

"I was checking the radio range, looking for the beam and watching the mountains when the center tank ran out of gas," he said. "Just as I reached over to switch on the front tank, a wing tip caught the trees. We just went inside the trees."

Both were knocked unconscious. Miss Klaben was the first to recover, and Mr. Flores regained consciousness a little later.

A ragged tarpaulin salvaged from the wreckage was set up as a shelter.

Mr. Flores had suffered a broken rib and facial injuries. Miss Klaben's right foot and left arm were broken and she had lost her shoes.

"We started a fire to keep warm," Miss Klaben said. "We had clothes (in her case five pairs of slacks), but no blankets."

Mr. Flores said he used fires, smoke and a mirror in attempts to attract attention. About 40 planes drew near the crash scene in the seven-week period, but all dived on past.

Using his knife, a chisel and a hammer, he fashioned rough snowshoes from branches, bark and twigs. He used them to mush through the heavy snow to a clearing three miles from the wreckage, where he stamped out an S.O.S. in big letters.

Four Nations To Consider New Seal Pact

By the Associated Press

Tokyo

Japan is expected to press for revision of the four-power seal agreement so it would permit sealing on the open seas, it is reported.

The Canada-Soviet Union-United States-Japan Seal Treaty, signed in 1957, expires in October, and a conference of the four countries is scheduled to consider the pact.

The treaty prohibits seal catching on the open seas. Seal operations on land are allowed by the United States and the Soviet Union—two countries where seals breed.

Seals breed on the American Island of Pribilof and the Soviet Islands of Commander and Robben in the North Pacific.

The Japan Fisheries Association said conservation measures under the treaty have greatly boosted the seal population,

and there is need for pelagic sealing.

An official who refused to be identified said "the population has become so great there is need to revise the treaty to allow seal catching on the high seas, otherwise fisheries resources will suffer."

He said the demand for seals is great in Japan and that fishermen want to be allowed to catch them.

The present supply of fur seals comes from the Soviet Union and the United States. The two countries, under the treaty, must each divert 15 percent of their catch to Canada and Japan.

Japan was expected to make a strong appeal for revision, the association official said.

However, the government fisheries agency said nothing definite has been decided. Selection of delegates is expected soon.

Sperm, Whales Killed

More than 20,000 sperm whales are killed each year. A sixty-foot whale yields eighty barrels of sperm oil.

School Teaches Arctic Survival

FAIRBANKS, Alaska (UPI) — When the Arctic wind howls through the midnight sky over the Alaska bush country and the temperature skids far below zero, a man's life depends on his wits.

Alaska and the whole of the Arctic Circle can quickly freeze the life out of the hunter, bush pilot or airplane crewmember who becomes lost or grounded.

But a chance for survival is the course offered to more than 700 military personnel and civilians each year at the Air Force Arctic Survival School at Eielson Air Force Base.

Eielson's winter climate, with temperatures seldom rising above 10 below zero and dipping frequently to minus 60, is considered ideal for Arctic survival training.

"We offer them a little life insurance," said Capt. Henry M. Gibson, commander of the school. "In this case they are their own beneficiaries."

Gibson, a former paratrooper and infantry officer, runs the five-day courses that include three days of classroom work and two days in the field with only winter clothing, a parachute and survival pack.

In a warm classroom, commercial airline crews, federal employees and military personnel learn the cold facts of building shelters, trapping small game, fire building and other practices. Then comes two days of putting everything to the real test.

Not long after the students hit the field in groups of six, they spread out to chop and gather wood for fire and shelter building. Fingers warmed by the bonfires unfurl each pack and soon six orange and white parachute panel lean-tos dot the tundra.

Before the early sunset, each student has finished his shelter and gathered enough firewood to last until the morning. He has also prepared a lunch of ersatz coffee brewed from melted snow.

If he is lucky at snaring rabbits, each student prepares a dinner of fresh meat. If not, it's self-prepared C-rations.

No available resources are wasted. Wire from parachutes is used to make snares or fish hooks or needles. The parachute itself becomes a shelter or a pair of mukluks or hundreds of other necessities. Paper from ration cans can be used to build a fire. The tin lids become fish lures.

Sleeping is a problem. Although the cold nights can be nearly 24 hours long, the men seldom sleep longer than seven hours. A scarf or other covering is kept over a man's face to prevent frost-bite and has to be moved periodically as breath moisture freezes.

Every minute of daylight is used to gather firewood or check food snares. And there are emergency signals to be built so aircraft can spot survivors.

EIELSON AIR FORCE BASE, Alaska (UPI) — Military forces of the Alaskan Command are trying to close a "cold endurance" gap between the American and Russian soldier.

In February, battle groups of the U. S. Army, Alaska — along with strike units from the U. S. mainland and light infantry from Canada — will go on winter maneuvers in one of the two coldest regions on the continent.

Their war games will be held in an interior wilderness so remote that the range of mountains bounding the north has no name. Temperatures are about 50-60 degrees below zero.

Maj. Gen. Ned Dalton Moore, who heads the army command in Alaska, says his job is to teach 8,000 troops how to fight and live in the frigid Polar back country.

He says a successful maneuver will demonstrate that American troops can fight an Arctic campaign.

To help train American forces to meet the dangerous "weather enemy," the Air Force operates a unique Arctic Survival School at this base, attended by members of all branches of the service.

The school is commanded by Air Force Capt. H. M. Gibson, a one-time combat paratrooper, who says it teaches students how to survive an aircraft mishap in cold, deep snow, rugged terrain and uncharted back country. They also must face hostile animals and trap others for food.

Thousands of air crew members, from generals to privates, and even commercial airline crew members, have graduated from the school. More than 700 crew-members pass the rigid tests each year.

To graduate, one must literally survive in the Arctic winter wilderness for at least 48 hours. In teams of five to six, deliberately abandoned in back country, they

Climbers Scale McKinley East Wall

By the Associated Press

TALKEETNA, Alaska

The mile-high, almost vertical east buttress of North America's highest mountain has been conquered for the first time by six mountain guides.

The men continued upward and reached the summit of 20,300-foot-high Mt. McKinley May 25. Their ascent was reported Friday by Mary Carey, Talkeetna correspondent for the Fairbanks News-Miner.

Warren Blesser, Middlebury, Conn., Pete Lev of Boulder, Colo., and Fullerton, Calif., and Fred Wright of Burbank, Calif., remained at the camp waiting for clearing weather so a bush pilot could fly them out.

The pilot, Don Sheldon of Fairbanks, flew the other three climbers here Wednesday. They are Al Reed, Lakewood, Colo., Jed Williamson, Pawling, N.Y., and Rod Newcomb, Jackson, Wyo.

Their ascent of the east buttress was confirmed by photographs May 20.

simulate a crew that has just bailed out or has crash-landed.

"We are always astonished by the number of persons who attend the school which is mandatory who have never slept out or can't even build a fire," says Capt. Gibson.

"Without proper protective clothing and a knowledge of how to finish shelter and warmth, a man would die in minutes."

Gibson and his staff of survival experts make certain every man leaves with knowledge of how to use his parachute for shelter, how to catch and skin animals, to start a fire without matches or lighter, how to operate on stricken fellow crew members.

"You've got to keep moving," says Capt. Gordon Rines, a Berlin, N. H., pilot. "If you stop, you've had it. You work 16 hours a day, improvising, making your own cooking and survival gear. It all must be done fast."

Ironically, despite the fact that snow is all around, water is the hardest thing to obtain. In the field, crew members say, enough snow cannot be melted to meet the thirst.

Here recently, when a class of 35 returned from the field, one came back with frostbite, another with wind chill.

All learn, however.

"If you don't pass this course," one crew member observed candidly, "you're dead!"

ALASKA BUILDERS FIGHT FRIGID SOIL

Use Artificial Refrigeration to Combat Thawing That Buckles Installations

FAIRBANKS, Alaska (AP) —

Permafrost, permanently frozen ground, is of great concern to scientists and builders in Alaska.

Permafrost underlies most of the surface of the state. The depth of the permafrost may reach 1,000 feet—but it is the frosty soil near the surface that causes trouble.

Permafrost is not unique to Alaska. It underlies much of the northern part of North America and Asia. Scientists estimate the frozen ground exists in one-fifth the land surface of the world.

In Alaska, scientists and construction engineers wage a continual battle to understand and solve the expensive heaving and buckling of permafrost.

One of the major problems concerns the proper method of planting a firm foundation in permafrost so that pilings and footings will not shift and crack the building they support.

Another problem is how to lay a paved road or airstrip over permafrost with any expectation it still will be flat a year later.

Artificial subsurface refrigeration—a seeming paradox in an area where the temperature goes down to 50 and 60 degrees below zero—is one method that has been tried.

The United States Army Engineers have done considerable work with artificial subsurface refrigeration.

The Army builders have put refrigeration pipes around foundation pilings to prevent the heat of Arctic installations from melting and thawing the frost-zone, a major cause of shifting action.

For the foundation of its station at Bethel, in southwestern Alaska, the Federal Aviation Agency planted foundation pilings in holes drilled deep into the permafrost. Toward the surface, where thawing takes place, the agency put sleeves around the piles.

The theory, which so far seems to work, is that the sleeves can rise and fall under the pressure of the thawing and freezing ground, leaving the piles firmly gripped in the never-thawing soil below.

One of the agency's biggest problems is aircraft runways in the Arctic.

"But we still have runways that heave and get out of level," officials report.

Moose Catching On the Alaska RR

By The Associated Press

ANCHORAGE, Alaska

The Alaska Railroad from Seward to Fairbanks is not all miles, moose and mountains but it has an awful lot of all three.

It is a wanderer which sometimes takes the lazy way along the shore of an icy fjord but often leaps a canyon on a high and spindly truss or shortcuts a mountain by tunneling through it.

The road crosses Moose Pass and Broad Pass and swings by Dead Man Glazier, Lake Nancy, Hurricane Gulch and places named Honolulu, Windy and Happy.

The shiny trail of main and branch line rail covers more than 500 miles from the Pacific almost to the Arctic Circle, in weather the railroaders never lie about. The truth is hard to believe.

Snows on the branch line to Whittier reach depths of 40 feet. Temperatures up near Fairbanks drop to 70 below zero. In the mosquito-filled summer, the can shoot to 98.

Though the railroad is dieselized and completely modern, one old, high-wheeled steam engine stands by for flood duty. Engines of the low-slung diesels are allergic to water.

When the snowplows slash a

trench for the trains after winter comes, the moose move in, as if the work was done just so they wuldn't have to flounder in the deep snow. They run for miles ahead of the trains and the engineer slows down, toots the whistle—even stops.

Despite all precautions, as many as 200 moose may be killed by trains in a single winter. On rare occasions, the moose derails the train.

General instructions include an order that a train stop after hitting a moose and the crew try to salvage the meat for charity.

The government built the railroad 40 years ago and has

created a bureau in the Department of the Interior to run it. The Alaska Railroad has developed a personality of its own; sort of a blend of diesel fumes and Robert W. Service.

Where else can a homesteader hand his shopping list to the crew member of a modern flyer and get his groceries back on the return run? Winter and summer, the railroad is the only link with the outside for many Alaskans. In winter, the Anchorage - Fairbanks passenger train runs twice a week. Starting late in May, the runs go daily.

Where else can a trapper stomp out of the bush on snowshoes, flag down the limited and ride 50 miles into town for the week end, slaking a long-nurtured thirst in the bar-dining car en route?

they can make much more economical use of their food than they do.

Mr. Hofmann takes special pride in his method of processing whale meat, for example. This meat has never become popular because of its penetrating, oily taste. Mr. Hofmann says his method of processing the meat eliminates this flavor and leaves only a tender steak.

In fact, he sees the whale as one answer to famine. A single whale produces an average of 800 pounds of meat, and he says, Canada could export 1,000,000 pounds a year.

And all this does not include the muktuk, which is the skin of the white whale. A full-grown animal has 400 pounds of muktuk around his body, says Mr. Hofmann, and an arctic traveler can survive on six ounces of it a day.

As a final touch to the dinner, which was attended by explorers, scientists, Royal Canadian Mounted Police officials, and others with interests in the far north, Mr. Hofmann served coffee with an arctic history.

The Arctic Circle Club was given a quantity of Russian coffee left behind when the Russians abandoned one of their weather stations near the North Pole. A small amount of this Russian coffee was dropped into each guest's cup.

Legendary-Gold Hunt Goes On
ANCHORAGE, Alaska — Prospectors still search the Yukon River basin in Canada and Alaska for the legendary Preacher's Creek, where in about 1860 a missionary is said to have found—and spurned—gold in large quantities.

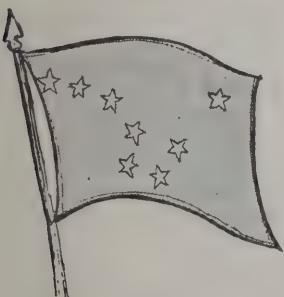
The Kodiak bear, which may weigh up to 1,600 pounds, is generally believed to be the largest meat-eating animal in the world, according to Collier's Encyclopedia.

Alaska's Flag Designed by 13-Year-Old

By Catherine L. Coppock
Moose Pass, Alaska

More than just a bright piece of cloth, a flag is a symbol whose color and design has a special meaning, signifying ideals, goals, hopes, history.

Alaska has an interesting flag, designed by Benny Ben-



son, a young boy from the Aleutian Islands. Benny was a 13-year-old student in the seventh grade at the Jesse Lee mission home at Seward, when

he designed the flag. His design consisted of eight gold stars (the Big Dipper and the North Star) on a field of blue.

In 1925 Governor Parks called at the old Post Office Building in Washington, D.C. He found the rotunda lined with flags of different states and territories, but there was none for Alaska. As a result, through the cooperation of the Department of Education and the American Legion in 1927 he instigated a contest to design a Territorial flag. Of the 142 designs submitted, Benny Benson's was chosen.

With his sketch of an Alaskan flag Benny gave the following explanation of his particular design and colors:

The blue field is for the Alaskan sky and the forget-me-not, an Alaskan flower. The North Star is for the future state of Alaska, the most northerly of the Union. The Dipper is for the Great Bear, symbolizing strength.

On May 2, 1927 the Territorial Legislature legalized Benny Benson's design as the official Territorial Flag of Alaska.

Copies of the legislative act making Benny's flag official, together with small Alaskan flags, were prepared for the school children of Alaska. The Commissioner of Education asked the Assistant Commissioner, Mrs. Marie Drake, to write something, telling the school children about the flag. So she wrote a beautiful poem, which was set to music by Elinor Dusenberry.

Then, in 1955, the Territorial Legislature enacted another law, naming "Alaska's Flag," with words by Marie Drake and music by Elinor Dusenberry, as the official song of Alaska.

For submitting the winning flag design Benny selected and received a course in diesel engineering and became an airways mechanic on Kodiak Island, where a street is named after him. Today his flag, dear to Alaskans, is still a symbol of beauty, growth, and strength.

Among the delicacies provided were: arctic char (fish) cocktail, muskrat sausage, roast reindeer, smoked buffalo, wild meat salad, whale meat muktuk (skin), and Labrador baked apple berry sundae.

As an afterthought, turkey and ham were provided for the less adventurous diners.

Erich Hofmann, a German immigrant to Canada who now is a culinary expert for the government's Department of Northern Affairs, prepared the dinner. His aim was to prove that arctic food can be tasty as well as nourishing. He also wanted to show the Eskimos

Eskimo Foods Get Gourmet Tag

By The Associated Press

Ottawa

The Canadian Government, with the help of a German-born chef, is setting out to help the Eskimos make better use of their native food.

Eventually, too, the government hopes to establish a taste and a market for arctic food in southern Canada and among

the gourmets of the world.

As part of this campaign, a dinner party was held in Ottawa recently. About 180 members and friends of a club known as the Arctic Circle joined the feast, which offered food which can be trapped, caught, picked or shot in the far north of Canada.

Eskimo Language Is Put Into Writing

By Ingeborg Wilson
The Christian Science Monitor

Fairbanks, Alaska

The University of Alaska at College, Alaska, should be the ideal institution for research as well as teaching the Eskimo language.

Yet it was not until 1960 that the Eskimo language was included in the University's curriculum. With the arrival of Dr. Michael E. Krauss, who came to the University of Alaska in 1960 as a visiting Carnegie Professor for research of unwritten languages, a long-standing dream of Dr. Minnie Wells was realized. Dr. Wells, of the English and Philosophy Departments, had for many years suggested that the Eskimo language be put into writing right here in Alaska where natives have spoken, yet never written, Eskimo since time immemorial.

Two Eskimo dialects are spoken by Alaska's Eskimos. "Yupik," the Southern Eskimo dialect, and "Inupiaq," the Eskimo dialect spoken in the Northern parts of Alaska.

The "Yupik" dialect was chosen at the University of Alaska for its curriculum.

When Dr. Krauss left the University of Alaska at the end of last year to devote his time to more research of the Eskimo and Athabascan languages at Eastern universities, Irene Reed took over his Eskimo classes for the duration of his leave.

"I feel very fortunate to have been given this opportunity," Miss Reed told me. "After all, I still have a long way to go myself. But once you get interested in the Eskimo language you don't want to stop. It is a satisfying feeling to help put an old, yet unwritten language into writing."

Actually, trying to establish an alphabet in the Eskimo language which would be all-around understandable to the Eskimo himself, is not exactly new. Early missionaries sent to Alaska were the first to attempt to put the Eskimo language into writing. They never advanced as far as the material that is on hand now, but they had a harder trail to blaze.

A rare book which is proof of the first attempts in this direction is called "Grammatical Fundamentals of the Innuitt Language." The author is the Rev. Francis Burnham, S.J. The book was published in 1901. According to Miss Reed, there are only about a handful of these books still in existence.

Furthermore, German universities made extensive studies of the Eskimo language. Das Institut fuer Sprachwissenschaften (The Institute for Lin-

guistics) conducted the research and on-the-spot studies mostly in Greenland.

At the University of Copenhagen, an extensive Eskimo Study Center is continually engaged in research of this kind.

I attended Miss Reed's class one day to get firsthand impressions of the work she and her students are engaged in.

The class consists of six pupils. Half of them take this course for the grade in the scholastic aspect. One student wants to apply his knowledge when he himself will be teaching in the bush (Alaska's outlying areas, where the popu-

lation is mostly Eskimo). He thinks that both he and his Eskimo pupils will profit greatly if he not only teaches them the English language but can speak to them in their own tongue and show them how they can put their ancient language down in writing.

The remaining two students are Eskimos who speak the "Inupiaq," the Northern Eskimo dialect.

Besides Dr. Krauss and Miss Reed, respectively, there is a resident informant who helps with the translations, sounds, and the alphabet. She is Martha Teeluk, an Eskimo woman

who was reared at St. Mary's Mission on the lower Yukon River. Before she came to the University of Alaska, Martha had worked as an instructional aide for the Bureau of Indian Affairs for several years. One day she was told that she could not teach any more because she did not have a degree.

She said to herself, "I'll show them and get that degree." With that she enrolled at the University of Alaska two years ago.

Martha is majoring in education and plans to return to her people "because they need me," she said. She wants to help raise the educational level of her people.

"Any place in Alaska will do," she stressed, "just so I can help the Eskimo."

In putting the spoken word into writing they are trying to establish an alphabet which will, phonetically, most closely resemble the spoken sound. The sound which is the most common is picked out and translated into a written letter, so that the average person who speaks the language will be able to pick it up and read it.

One great distinction from other languages is the fact that words are run together. That is the way they are spoken, and in putting them into writing researchers and teachers have so far not been able to come up with a different answer.

Miss Reed gives this example: *getunrarpuk* (son our) *uuminaqlartuq* (nuisance always) *litnaurvigmik* (learning place of in)—freely translated, "Our son is always a nuisance in school."

Mighty Defense Job For Tiny Bering Isle

By United Press International
ANCHORAGE, Alaska.

A tiny island in a cluster around Attu at the tip of the Aleutian chain shelters an integral part of the air defense of the North American continent.

The island is Shemya. It houses gigantic air force radars and other technical equipment that military authorities regard as "top secret." It is one of the closest U. S. military installations on American soil to Russia.

Shemya is more than 1,300 miles from the nearest U. S. Air Force installation in the Alaskan Air Command at King Salmon. And it was from King Salmon that U.S. fighter planes streaked into the sky when a Russian plane flew over Alaska territory on March 15. Another Russian plane the same day flew over waters regarded "out of bounds" for Soviet planes. Both Russian planes may have been scouting Shemya.

The Air Force says very little about Shemya. Officials of the Alaskan command at Elmendorf Air Force Base are touchy on the subject. Queries are greeted coldly.

There is little on the island other than the Air Force station, its highly-secret equipment, Air Force and Army personnel and a dog or two. There are no women.

Although the strategic mechanisms on Shemya today are wrapped in military secrecy, the island has a history that started 20 years ago in the bitter Aleutian campaign of World War II.

Japanese surveyors had staked the island for a bomber base. A short distance away Japanese

troops held the island of Attu for 11 months in what was the first enemy invasion on American soil since the war of 1812.

In January, 1943, the war councils on both sides pinpointed Shemya as strategic. It was 1,800 miles from Anchorage in one direction and the same from Tokyo in the other. The time of occupation was approaching on a collision course. Then suddenly it was averted.

A few miles short of their destination a Japanese Shemya task force was discovered by a U. S. plane flying a scouting mission. The lone plane circled the convoy without a shot being fired from either side and observed an unaccountable about-face.

Apparently the Japanese wanted their Shemya move to be a surprise and, when it was discovered, they withdrew.

Meanwhile, the battle for Attu took place. After nearly every Japanese soldier was killed the American forces were sent to Shemya.

Battle-weary infantrymen and engineers were to secure the island in the event enemy troops were present. Some Japanese survey stakes were found but the Japanese were not there.

Part of Shemya's value to the military is in its level topography. There isn't a hill higher than 500 feet above sea level. Because of the relatively level terrain the island is called a stationary flattop. Planes can get on and off in a variety of foul weather without running the risk of smashing into unseen mountains.

Jan. 5

NOME, Alaska (AP)—Two Eskimos rescued from a drifting ice floe, where an older companion died of exposure, are recovering.

The three were stranded six days on the ice island, which broke from shore while they were hunting seals. Saturday, the crew of a search plane spotted John Angusac, 38, and Ignatious Annayoc, 42, both of King Island, as they frantically waved a sweater and a bag. Another hour, and the search would have been abandoned.

The island had drifted about 100 miles from King Island to a point southwest of Nome.

Hunger and sub-zero cold killed Frank Kayvanuk, 55, shortly before the rescue.

2 Eskimos Rescued From Drifting Ice

BALLOONS SOUGHT FOR ARCTIC STUDY

Soviet Weighs Possible Peril in International Project

By BEN A. FRANKLIN

The New York Times Western Edition

WASHINGTON, Jan. 20.—Scientists have proposed putting a series of 50 large balloons in a circular path around the Arctic as part of the experiments planned during the International Year of the Quiet Sun.

The project, Pocibo, for polar circling balloon, could involve planned or accidental overflights of Soviet territory at altitudes around 100 thousand feet.

A political dividend to the scientific project, if the Russians agree to it, may be to dispel chronic Soviet suspicions of foreign objects flying over the Soviet Union.

The International Scientific Enterprise is related to the highly successful International Geophysical Year which spanned 18 months in 1957 and 1958.

Actually the enterprise will cover two years, starting Jan. 1, 1964. It takes its name from the fact that solar activity—sun spots and other disturbances—will be at a minimum in the next three years. Observations of the sun during the I.G.Y. period occurred at maximum solar activity, a fact that makes the research planned during the forthcoming enterprise, when the sun will be relatively "quiet," particularly useful to scientists.

The solar cycle of maximum-to-minimum-to-maximum activity runs about 11 years. The sun has never before been studied systematically during "quiet" periods.

The polar balloon project has been proposed by Prof. John R. Winkler of the University of Minnesota. If negotiations are successful, the Pocibo plan would be financed by a grant from the National Science Foundation, a Government agency responsible for encouraging basic research and education in the sciences.

Prof. Winkler's proposal for the Pocibo is designed to take advantage of known circular air currents over the polar region. Very little else is known about the Arctic atmosphere.

The balloons would rise to about 100 thousand feet, level off automatically, and drift with the prevailing westerly winds in the polar winter, and with easterly winds in the summer. In the polar summer, instruments could monitor the sun 24 hours a day.

Some 50 balloons, 40 feet in diameter and containing one

Russia Seeking Coal In U.S. Oil Lease Area

United Press International

OSLO, May 8.—The Soviets have approached Norway with a request to purchase a coal field in Spitzbergen where an American oil company already has secured rights to prospect for oil.

The request is 100 percent certain to be turned down by the Norwegian government, the source said.

UPI's source said the Soviet government, through its embassy in Oslo, made an approach last March to the Store Norske Spitzbergen Kull-Kompani (the Great Norwegian Spitzbergen Coal Co.) to buy an area which is adjacent to their former coal mining town of Barentsburg in West Spitzbergen.

million cubic feet of gas, would be launched over the two-year period. Devices carried aloft aboard a 250-pound gondola would be prepared, installed and monitored by scientists of many of the 50 countries scheduled to participate in the over-all scientific enterprise. The proposed schedule calls for launching one balloon a week, at a cost of \$8,000. The useful life of each balloon would be about a week.

The balloons would be tracked by a drifting radar station in the Arctic.

Russians Select Ice Floe For Arctic Research Base

The New York Times

MOSCOW, April 12—Soviet Arctic fliers have selected a large ice floe for a new floating research station, North Pole XII.

The newspaper Sovetskaya Rossiya said that an airlift of ten scientists and their equipment to the floe, 750 miles north of Cape Schmidt in northeast Siberia, was scheduled to begin in the next few days.

The new station will replace North Pole XI, which has been endangered by fissuring and has floated close to Canada's Arctic archipelago, far from the Soviet supply bases.

Russians Quit Ice-Floe Camp

LONDON, April 23 (Reuters)—Soviet scientists have left the ice-floe scientific station "North Pole 2," which drifted into the Canadian sector of the Arctic, the official Soviet press agency, Tass, said today. Tass said the staff left food, medicine and fuel in the camp for the ice floe's next occupant, if any.

Barentsburg is situated on the south shore of the Isfjord, the main sea inlet on the island of West Spitzbergen.

The area wanted by the Soviets covers 20 square kilometers and is known to hold rich deposits of high quality coal. It has not been exploited by the Norwegian because of the long distance from any main Norwegian mining center.

The American Caltex Oil Co. last year obtained rights to drill for oil in the same area, it was learned here.

The Soviets have supported their request to buy the coal field by the assertion that their present coal mines in the Barentsburg district are being rapidly depleted.

RUSSIANS TO LEAVE NORTH POLE FLOE

The New York Times Western Edition

MOSCOW, March 27—The Soviet Union has decided to evacuate its ice floe station, North Pole 11, since repeated fissuring has endangered its scientific staff working in the area north of Canada.

Polar fliers are now exploring the Arctic wastes north of Wrangel Island, off the northeast coast of Siberia, for a suitable location for a new research station to be called North Pole 12.

As the Soviet press reported the latest developments in the Arctic exploration program under way since 1950, word was received from the Antarctic that a Soviet tractor train had completed an overland trip of almost 2,000 miles to reactivate its Vostok station.

The station, which was closed as a permanent Soviet observatory before the southern winter of 1962, has been reopened as one of four posts that will participate in the International Year of the Quiet Sun. The year, beginning next Jan. 1, will be an international effort to study the sun and its effect on the earth.

North Pole 11, which was first manned in April, 1962, has drifted more than 1,000 miles from the coast of Siberia to the vicinity of the Canadian archipelago.

Seaweed to Yield Fodder

MOSCOW (AP)—A plant to process seaweed nutrients for fodder and medicinal uses will be built not far from the Barents Sea.

Reds Say A-Sub Sailed to N. Pole

MOSCOW, Jan. 26 (AP).—The Russians claimed on Saturday a Soviet nuclear-powered submarine has demonstrated that such vessels can take up "combat station" under the North Pole to stop any sneak attacks by enemy rocket-firing subs.

Izvestia, the government newspaper, said the atomic submarine Leninsky Komsomol had completed a cruise to the North Pole in a mock maneuver under Arctic ice "to detect and destroy 'enemy' nuclear subs trying to approach Soviet shores."

The Leninsky Komsomol cruised for many days in submerged state under the ice of the North Pole area," the newspaper said.

Izvestia did not give the date of the Leninsky Komsomol's mission but said: "This heroic cruise is a remarkable stage in the history of domestic and international navigation."

Accompanying the story was a picture, purporting to show the submarine's crew planting a flag at the North Pole after having broken through the ice.

The Russians claimed they were the pioneers in voyages under Arctic ice and said American claims of being first were "contrary to the truth."

The American Nautilus, the world's first known atomic-powered submarine, made what was heralded as the first transarctic passage in August, 1958. Several other U.S. atomic subs since have made trips under the ice to the North Pole—the Sargo in the dead of the arctic winter in February, 1960.

Izvestia said Soviet submariners were, "in the beginning of the 1930's, bravely sailing under the ice, and our atomic submarines much earlier than the American ones visited the high latitudes of the Arctic Ocean."

The Leninsky Komsomol, during its training cruise in the Arctic basin, "twice passed under the ice of the North Pole," the newspaper said, adding:

"The sub was set the following task: to pass under the Arctic ice to the North Pole and to take up there a combat station with the aim of stopping the rocket-carrying submarines of the 'enemy' from using the Arctic area for striking a rocket blow."

Greenland Schedules Ten New Definitives

According to a recent announcement of the Royal Greenland Trade Dept. forwarded to Linn's by Philatelics Scandinavia of Cleveland, Ohio, considerable activity in the new issues field is taking place in that country.

Ten current definitives of the King Frederik IX and Polar vessel "Gustav Holm" types are to be replaced by three new designs.

The 1, 5, 10, 12, and 15 ore values will show Northern Lights, with the remaining are values — 20, 25, 30, 40, 50, and 80—showing the King dressed in a Greenland "Anorak". A new Polar Bear design will appear on the 1, 2, 5, and 10 Kroner values.

The first part of the new set will be issued March 7: 10, very dark green, 50. claret, 100. dark green, 120. light green, and 150. mauve. The remaining values will appear later, after due advance notice is given.

The stamps were designed by Viggo Bang of Denmark, with engraving by Miss M. Franzen of Sweden (1-150.) and C. Slania, also of Sweden, for the King and Bear types.

South Georgia—The new definitives are recess-printed by De La Rue, and show the portrait of the Queen and St. Edward's Crown, and views as follows: ½d, Reindeer; 1d, South Sandwich Islands; 2d, Sperm Whale; 2½d, Chinstrap and King Penguins; 3d, Fur Seal; 4d, Fur Whale; 5d, Elephant Seal; 6d, Sooty Albatross; 9d, Whale catcher; 1/-, Leopard Seal; 2/-, Shackleton's Cross; 2/6, Wandering Albatross; 5/-, Elephant and Fur Seal; 10/-, Planckton and Krill; one Pound, Blue Whale.



Postal Dog-Sled Route Is Passing Into History

WASHINGTON, June 12 (AP)—The dog-sled run, representing a colorful era in the United States mails, will end officially tomorrow.

Actually Chester Noongwook, owner of a dog team, made his last run last January, when a plane took over his route on remote St. Lawrence Island in the Bering Sea.

But postal old timers decided that a ceremony should be held as the dog sled took its place in history with the Colonial Post rider, the Overland Mail and the Pony Express.

In Fairbanks, Alaska, Assistant Postmaster General William J. Hartigan will give Mr. Noongwook, who is 27 years old, a certificate commanding him for "exceptional services in carrying the United States mails, under difficult conditions, in the finest traditions of the American postal service."

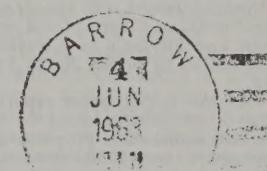
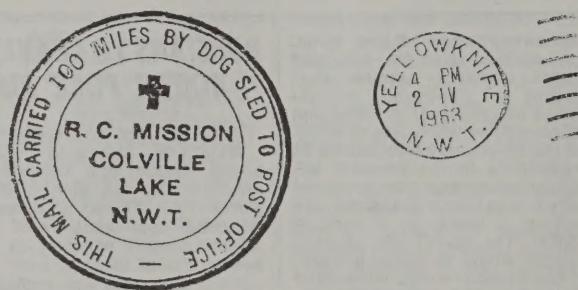


The special Canadian commemorative postage stamp honoring Sir Martin Frobisher will be released for sale on August 21 instead of July 29th as previously announced, according to Postmaster General Azellus Denis of our northern neighbor.

Mr. Denis explained that he had set back the release date of the Frobisher stamp to August 21 so that it could be placed on sale at the time of "Passage 7", a proposed motor vessel trip which was to enter many areas opened originally by Frobisher's explorations. The voyage has now been postponed until 1964.

The PMG added that cancellation of the voyage came too late to let the stamp schedule stand as previously announced.

"Polar Post" is the journal of the Polar Postal History Society, 78 Lovell Rd., Cambridge, England. Edited by D. B. Naunton, it is a scholarly source of information about mails handled in the Arctic and Antarctic ever since the earliest expeditions.



British Antarctic Territory Set

Various means of polar area transportation are featured on the 15-value set of definitives released February 1 for British Antarctic Territory. It was produced by Bradbury, Wilkinson & Co., Ltd. in commemorative size, horizontal format, after designs by Michael Goaman.

In addition to scenes from survey work, each stamp also shows the Annigoni portrait of Queen Elizabeth and the St. Edward's Crown. Nine of the 15 are in a single color each, the rest are bicolor productions.

Values and subjects are: ½d, Motor Ship "Kista Dan"; 1d, men on skis drawing a sail sled; 1½d, muskeg (an eight-wheeled track vehicle); 2d, skiing; 2½d, beaver (a monoplane with floats instead of wheels); and 3d, the RRS "John Biscoe".

Also, 4d camp scene with tepee tent and dog sled in background; 6d, HMS "Protector"; 9d, dog sledging; 1/-, otter (airplane with skis); 2/-, five huskies (dogs); and 2/6, a helicopter. The 5/- shows a snocat (track vehicle); 10/-, the RRS "Shackleton"; and the one Pound a map of the South Polar area.



FROM THE BOTTOM OF THE WORLD, Antarctica, to be specific, come this cover through the courtesy of Carl W. Fisher, with the U.S. Naval Support Force now stationed there. The cachet to the left has at its bottom the legend, "First Atomic Reactor For The Antarctic". In the left hand corner is the autograph of Lowell Thomas famed news commentator, explorer and producer of travel movies. Along the right edge of the cachet is that of General James (Jimmy) H. Doolittle whose aviation career is on the fabulous side.

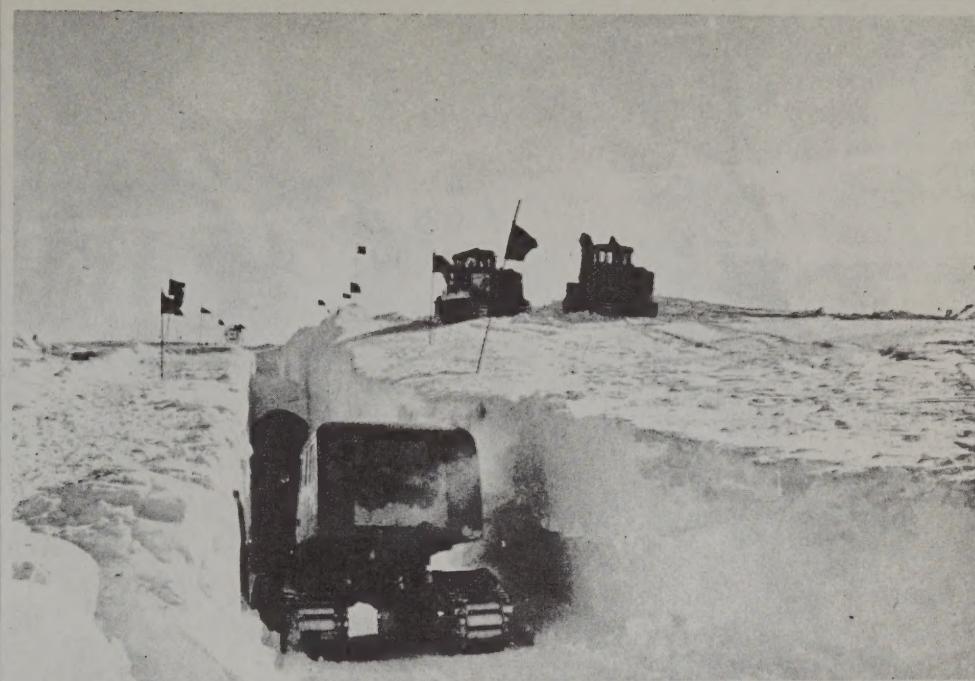
CENTURY: SECRET CITY OF THE SNOWS. Lee David Hamilton. (Putnam. \$2.95.) Mr. Hamilton has presented a well organized, clear account of the incredible underground city in the Arctic. In the straight-forward manner of a journalist, he creates a startling picture of the world of ice worms (cooks, mechanics, and other men who stay for months) and bluebirds (scientists who come and go, working on projects). Aspects of life on the "crevasse-pitted" ice sheet and under the awesome icecap — "housekeeping in an atomic igloo"; unique physical and psychological problems of the "buried" men; scientific advancements in the new area of rheology — the study of the flow of matter; the challenge of building with snow and snow compounds, and many other intriguing facets of this other world, — are discussed in comprehensible terms by a man who has been there. A fascinating, unusual study which will interest the scientific and unscientific alike. From *Virginia Kirkus Bulletin*, April 15, 1963.

HEROES OF POLAR EXPLORATION. By Ralph K. Andrist in consultation with Rear Admiral George J. Dufek, U. S. N. (Ret.). Illustrated. 153 pp. New York: American Heritage Publishing Company. \$3.95

A NEW series, *Horizon Caval Books* dealing with world history, culture and the arts, makes its debut with "Heroes of Polar Exploration"

"Heroes of Polar Exploration" covers its field thoroughly, from the voyage of Eric the Red in 982 to nuclear subs under the Arctic ice and includes the shorter and less colorful annals of the Antarctic. The text, dealing almost exclusively with action, moves rapidly. The total impression of progress is overwhelming as the story moves from the gruesome discoveries of the lost Viking settlements in Greenland through the pathetic films found on the bodies of Robert Scott and his companions, on to the everyday efficiency of our present sea and air contacts with both poles.

The long and honorable story of an amazingly durable ship is told by Stella F. Rapaport in *The Bear: Ship of Many Lives* (Dodd, Mead, \$3.25), winner of the Boys' Life-Dodd, Mead Writing Award. Built in 1874, the rugged Bear finally capitul-



CRREL photo

During Century construction, tracked vehicle moves down ramp.

The Problems of Isolation By Herbert B. Nichols

Antarctic Command, by Finn Ronne, Captain, USNR. New York: Bobbs-Merrill Company. 272 pp. \$5.

This is an intensely personal book produced from the depths of conscience by the leader of the United States Antarctic Expedition to the Weddell Sea, the first group to winter over at Ellsworth Station on Filchner Ice Shelf, between Deepfreeze II and III (1956-58). Some would say it should never have been written, for it violates the "code of the Antarctic," which is to forget unpleasant behavior problems and write only about the good.

"The story I have recorded here," says Captain Ronne, "is one of men living in a hostile environment and under great nervous stress. As such, their behavior occasionally assumed a degree of eccentricity and intensity which would not be representative of their normal demeanor. That statement is as true of the author as of the people I describe." Much later he adds, "By telling my story in considerable detail, it is my hope that some constructive thought may be given to the realities of operating in the isolated areas on this earth as well as in outer space."

Fifty years ago, Finn Ronne's father accompanied Amundsen on the venture that in December, 1911, resulted in discovery of the South Pole.

Heading the Weddell Sea group during IGY, Captain Ronne "wore two hats" signifying a dual capacity as commander of the military detachment and chief scientist. He needed still a third, he says, and more real authority over a troika outfit that included a detachment of airmen as well as officers, seamen and natural scientists. That trouble was brewing was indicated while Seabees

were building Ellsworth and the author and this reviewer were VIP passengers aboard the U.S.S. *Wyandot*. Word was passed topside then, that the IGY researchers would do their assigned data-gathering tasks but no house-keeping. They would recognize no authority but the IGY Committee of the National Academy of Sciences. The extent to which this lack of respect stretched without ending in mutiny, would be scarcely believable without this day-by-day account.

A few random quotations will give the flavor:

"One petty roadblock after another . . . the station wasn't complete . . . none of the equipment was in place . . . it was a sloppy beginning . . . [then came] a close approach to a fatal accident . . . drinking made fraternization easy and we had far too much beer and liquor available for my liking . . ."

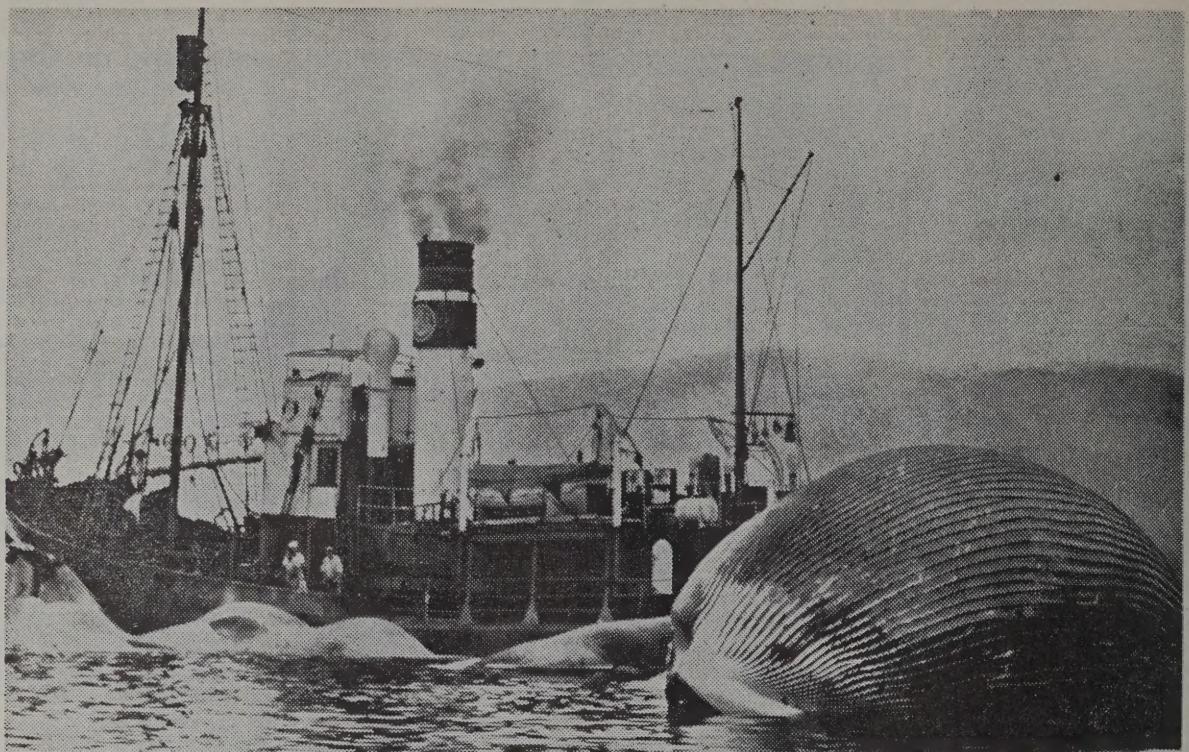
With almost all of the book devoted to detailing camp troubles, the author devotes one chapter to his geographic explorations which led to discovery of Berkner Island and adds a 16-page appendix on the scientific program as a whole.

As a sincere attempt to chronicle the problems that confront explorers during isolation, this volume will find its place among the many others that have resulted from expeditions to the polar regions. Noticeably lacking among the illustrations is any group photo of Ronne's companions, nor has he listed them as he did in his first book. The map is adequate; but there is much repetition throughout, much interjection of inconsequential material, a sprinkling of errors and an obvious need for more careful editing and proofreading. *The Christian Science Monitor*

lated to stormy seas last month while being towed from her longtime berth at Dartmouth, Nova Scotia. In the years since her launching, the Bear served as a sealer, an Arctic

World War II she worked for

the Coast Guard. Mrs. Rapaport gives an interesting if somewhat overburdened account of the Bear's proud career. Illustrated with photographs and with the author's drawings.



DEEP-SEA BOOTY: Immense sperm whales, shot in Antarctic waters, are hauled by hunting vessels to factory ship for processing. Companies using the oil from these whales are concerned by drop in number of whales caught.



DOG POWER FOR ANTARCTICA: Frank Graveson, left, of Dunedin, New Zealand, a mining engineer turned dog handler, with some Huskies used by New Zealand research

group at Scott Base. With him are David Richards, right, of Christchurch, New Zealand, base radio operator and post office supervisor, and a scientist who helps train dogs.

The New York Times (by Allyn Baum)